polaris

Specifications:
Wingspan: 50 in.
Wing Area: 715 sq in.
Airframe Length: 39.25 in.
Weight: 4.5 - 6 lb.

CONSTRUCTION MANUAL

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 at two different 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 an 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.

Old School MODEL WORKS

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:

- 2 LP1 - laser cut 1/8" x 5" x 24" lite ply
- 2 LP2 - laser cut 1/8" x 5" x 24" lite ply
- 2 LP3 - laser cut 1/8" x 2" x 24" lite ply
- 1 LP4 - laser cut 1/8" x 5" x 12" lite ply
- 1 LP5 - laser cut 1/16" x 3" x 2" ply
- 1 DH1 - laser cut dihedral brace 1/4" ply

- 2 BP1 - laser cut 1/8" x 4" x 24" balsa
- 2 BP2 - laser cut 1/8" x 4" x 24" balsa
- 2 BP3 - laser cut 1/8" x 4" x 24" balsa
- 2 BP4 - laser cut 1/8" x 4" x 24" balsa
- 1 BP5 - laser cut 1/8" x 4" x 12" balsa
- 1 BP6 - laser cut 1/8" x 4" x 12" balsa
- 1 BP7 - laser cut 1/8" x 4" x 12" balsa
- 1 BP8 - laser cut 1/8" x 4" x 12" balsa
- 1 BP9 - laser cut 1/4" x 4" x 24" balsa
- 1 BP10 - laser cut 1/4" x 4" x 8" balsa
- 2 BP11 - laser cut 1/16" x 4" x 24" balsa
- 2 BP12 - laser cut 1/16" x 4" x 24" balsa
- 2 BP13 - laser cut 1/16" x 4" x 24" balsa
- 2 BP14 - laser cut 1/16" x 4" x 12" balsa

- 3 1/8" x 4" x 12" balsa sheets
- 4 1/16" x 4" x 36" balsa sheets
- 2 1/16" x 4" x 24" balsa sheets

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

Hardware parts included in this kit:

- 1 Hatch latch
- 16 2-56 x 3/4" self tapping screws
- 5 2-56 x 5/16" self tapping screws
- 2 2-56 x 1/2" machine screws
- 4 2-56 x 3/4" machine screws
- 2 5/32" wheel collars
- 2 wheel collars set screws
- 1 small control horn
- 2 large control horn
- 4 plastic landing gear straps
- 2 1/4-20 x 2" wing bolts
- 1 1/4" x 4" dowel
- 2 pre-bent main gear legs
- 1 nose gear assembly
- 1 spring latch

Other items included in this kit:

- 3 - Rolled plans (fuselage and 2 wing)
- 1 - Construction Manual
- 1 - 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: 700+ watt electric, 4-6s lipo, 65+ amp ESC (or .45-.61 2-stroke glow engine)
- Propeller
- Engine/Motor mount and mounting hardware
- Fuel tank: 6-8 ounce and fuel tubing (if glow)
- Transmitter - (4 channel minimum with elevon mixing)
- Receiver - (4 channel minimum)
- Servos: 3 standard-sized (electric), 4 (glow) - high quality, 60+ in/oz of torque or higher servos are recommended.
- Servo extensions: 2 for elevon servos (8-12")
- Pushrods - two 6" for elevons, 24" rudder, 13" for nose gear, 17" for throttle (if glow)
- Clevises for the pushrods.
- Wheels: two 2.5" for mains, one 2.25" for nose *(Du-Bro Chromies look great - hint, hint).*

- Covering: If you're using simple color scheme, one or two rolls of iron-on covering will be enough. You will need more if applying a more complicated livery.

Additional Required Building Tools and Adhesives

- Drill & assorted drill bits
- Hobby knife and new blades
- Sandpaper: coarse (80 or 100 grit) & medium (150-200 grit)
- Pencil or pen
- Ruler
- T-Pins
- Waxed paper
- Building board
- 2-part epoxy (15 or 30 minute), 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

We advise the following:

Closely inspect the supplied laser-cut parts for damage. If you find any damaged or missing parts, contact us within 60 days of purchase (not your dealer).

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 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.

You'll notice a check box next to each step. Check these off as you go along so you don't miss a step. Some steps (building the wing) have two boxes - this means the step will be done twice - once now and once later (when told to repeat) for each wing half (or other part).

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 Polaris 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/polaris/

IF YOU READ NOTHING ELSE IN THIS MANUAL, PLEASE READ THESE FIVE POINTS.

#1 - We've done everything we can to make the Polaris a fun and easy to assemble kit. That being said, THIS IS NOT A BEGINNER KIT. If you've never built this type of balsa kit before, you will probably experience many challenges along the way. This manual is not written for beginners - it is assumed that the builder has the skills and techniques needed for these steps.

#2 - PLYWOOD HAS SLIGHT BOWS IN IT 93.48% OF THE TIME. We don't like it, but that's the way plywood is. Because of this, we engineered the Polaris to eliminate these warps whenever possible - we'll make recommendations on how to overcome them as we go along.

#3 - BALSA HAS SLIGHT BOWS IN IT 81.53% OF THE TIME. We don't like it, but that's the way balsa is. We'll make recommendations on how to overcome them as we go along.

#4 - It is very important that you assemble the Polaris 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.

5 - Save ALL of the scrap wood as you build - the ends of sticks, the left over sheets, etc. You will use some of this in assembly, and can use other parts if you need repairs.

Welcome to the Simitar Squadron!

Though Simitars operate on the concept of a flying wing, they don't really look like a flying wing, neither do they appear to be conventional in nature. So, what are they and what makes our Polaris (and other Simitar designs) different?

First off is performance. Because the Polaris can accept a wide range of power, you can tailor it to your flying style - fast, slow, aerobatic, a cruiser, etc.

Second, no stall. Reduce power, gradually feed in up elevator and as it slows down, the nose will automatically drop a bit. This reduces the angle of attack - keeping it from stalling.

Finally a Simitar is directional in flight, in that it will remain in most any attitude it is set in. That makes it great for aerobatics - loops, rolls, Cuban-8's, even hammerhead turns!

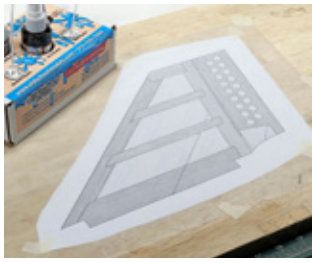
And remember, building is not a race. You are the craftsman and if you take your time, take the time to understand steps, and make the effort to do good work, it will certainly show when the airframe is built.

☐ **InstaCAddy**

Throughout this manual, you'll see photos with our InstaCAddy on the bench. This is a unique collection of Bob Smith C/A glues, accelerator, and pipettes. What makes this special is the box, as it has cutouts that make it the perfect tool to hold everything in one spot - ***and the glue won't spill!*** If you're needing C/A, consider our InstaCAddy!

Let's begin construction by building the vertical fin & rudder of your Polaris.

☐ **Prepare your work area**



Position the part of the fuselage plans with the vertical fin on your flat building surface and tape it into position. Tear off a length of waxed paper long enough to cover that portion and tape it over the plan.

☐ **Step 1 - Rudder Assembly (VF9, VF10)**

Locate VF9 from BP8 and both VF10s from BP13s. Glue one VF10 to VF9 as shown, being careful to line it up along the edges. Note that it only aligns correctly in one way.
When in place, flip VF9 over and glue the other VF10 in place, again perfectly aligned.

☐ **Step 2 - Rudder Assembly (VF11)**

Locate both VF11s from LP5. These are glued in place, one to each side, as shown here. Again make sure they aligned properly when applying glue and attaching them.

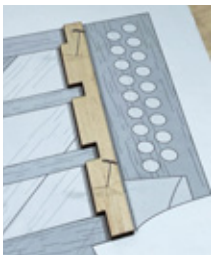
Set the rudder assembly aside.

☐ **Step 3 - Vertical Fin Assembly (VF8, VF9)**

Locate VF8 and VF9 from BP12. These are glued together to form the vertical fin's port and starboard sheeting. When gluing, make sure the joint between VF8 and VF9 is perfectly flat along it's length while the glue cures. Make two identical parts.
Lightly sand along the joints, on both sides of the sheets so they're flat and smooth.

Set these parts aside.

☐ **Step 4 - Vertical Fin Assembly (VF1)**

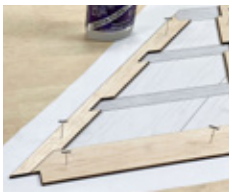


Locate VF1 from BP7. Pin this in place over the plans as shown, making sure it's properly aligned and the orientation is correct.

☐ **Step 5 - Vertical Fin Assembly (VF3)**

Locate VF3 from BP8. Glue this in place to VF1, applying glue only to where the two pieces touch each other. Pin VF3 in place to keep it aligned.

☐ **Step 6 - Vertical Fin Assembly (VF2)**



Locate VF2 from BP7. Glue this in place to VF3, applying glue only to where the two pieces touch each other. Pin VF2 in place to keep it aligned.

☐ **Step 7 - Vertical Fin Assembly (VF6)**

Locate VF6 from BP5. Glue this in-between VF1 and VF3, in the lower set of notches, as shown here.

☐ **Step 8 - Vertical Fin Assembly (VF5)**

Locate VF5 from BP5. Glue this in-between VF1 and VF3, in the upper set of notches, as shown here.

☐ **Step 9 - Vertical Fin Assembly (VF4)**

Locate VF4 from BP7. Glue between VF1 and VF2 to form the top of the fin and complete the frame.

☐ **Step 10 - Vertical Fin Assembly (sheeting)**

Remove the pins from the vertical fin frame you've just assembled. You can leave it on the board, as it's probably tacked in place to the waxed paper.
Lightly sand this port face to make sure it's completely flat.
Then, locate one of the sheets you created in step 3 and glue the sheet to the framing as shown here. Apply pressure over the entire surface to keep it flat and bonded to the internal framing.

When the glue has cured, remove this assembly from the board, flip it over and lightly sand the starboard side. Then locate the other sheet and attach it to the starboard side, again making sure it's perfectly aligned.

This completes the vertical fin & rudder assembly. Set these pieces aside and remove the fin plans from your building board.

☐ **Prepare your work area**

Tape the fuselage plan over your building surface and cover it with waxed paper.
The fuselage plans will be used more for reference, than actually building on them, but you'll need the long length of waxed paper anyway for many of the following steps.

☐ **Step 11 - Fuselage Assembly (FS3, FS4)**

Locate both FS4s from BP3 and both FS3s from BP2. Glue one FS3 to one FS4, as shown, to create the aft fuselage sheeting. Note that there's only one way in which the two pieces will correctly fit together. Once you're sure how they go together, apply glue along the edges where the two pieces will touch, then attach the two together into a single sheet. Make sure the pieces are flat along the entire joint.

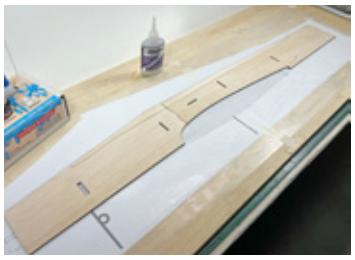
Make two matching FS3/FS4 assemblies.

☐ **Step 12 - Fuselage Assembly (FS1, FS2)**

Locate both FS1s from BP4 and both FS2s from BP3. Glue one FS1 to one FS2, as shown, to create the forward fuselage sheeting. Again, there's only one way in which the two pieces will correctly fit together. Once you're sure how they go together, apply glue along the edges where the two pieces will touch, then attach the two together into a single sheet. Make sure the pieces are flat along the entire joint.

Make two matching FS1/FS2 assemblies.

☐ **Step 13 - Fuselage Assembly (fuselage sides)**



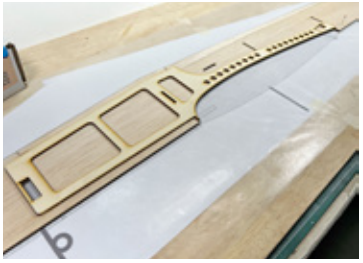
Now, take one FS1/FS2 assembly and one FS3/FS4 assembly. These are glued together to form one of the fuselage side sheets.

It's best to line these up over the plans to assure the side will be straight. Test fit them together first, then when satisfied, apply glue along the seam and attach the two assemblies together.

Make sure the pieces are flat along the entire joint. Once the glue has cured, lightly sand the completed sheet on each side, along all of the glue joints, so it's perfectly smooth and flat.

Make two matching fuselage side sheets.

☐ ☐ **Step 14 - Fuselage Assembly (FS5)**



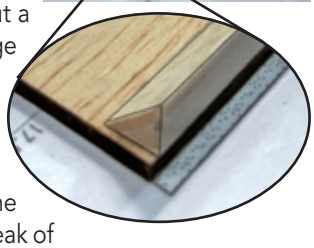
Now locate both FS5s from LP2. These are glued to the inside face of each fuselage sheet you've just created. *Note: you need to make a left and a right. This means the finished pieces will be mirror images of each other - VERY IMPORTANT!*

Start with the starboard sheet first, as shown in the photo above. There aren't tabs to automatically align this for you, but there are plenty of cutouts, and the entirety of the wing saddle to give you reference points on how they align.

When you're satisfied with how these should align, apply glue to FS5, then attach it to the starboard sheet. Make sure that it's flat along it's entire length and perfectly aligned.

Do this again to create the *mirror image*, port fuselage side sheet.

☐ ☐ **Step 15 - Fuselage Assembly (triangle strip)**



Focusing on one side at a time, you'll now be measuring and cutting strips of the 3/8" x 36" balsa triangle that attach along the top and bottom inner edges of the fuselage sides.

Start with the starboard sheet. Place it as shown here, then measure and cut a strip that runs along the bottom edge - from the front of the fuse sheet, back to the leading edge of the wing saddle.

Then measure and cut another strip to run along the top edge - from the front of the fuse sheet, back to the peak of the fuselage, just behind where the canopy will sit.

How the pieces are attached is crucial. Note the magnified section. The 90° corner of the triangle stock should be aligned with the edge of the siding, with the 45° angle of the stock on the inside of the fuselage, as shown.

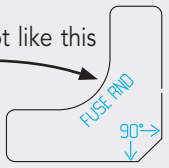
☐ ☐ **Step 16 - Fuselage Assembly (triangle strip)**

Now cut and attach more of the 3/8" x 36" for the top and bottom of the aft fuselage. One piece should run along the top - from the fuselage peak, to the rear of the sheeting. The other from the trailing edge of the wing saddle to the rear of the fuselage.

It's OK to piece these together from smaller sections, as needed.

Once the starboard sheeting has been completed, go back to step 14 and repeat steps 14 through 16 for the port sheeting, then move on to step 17.

Enter the Radius Gauge



Located in LP2 is a radius gauge, which looks a lot like this shape.

It has a dual purpose. The inner portion is a gauge for shaping the fuselage later on the build. But the outer edges are cut at a perfect 90° angle - something you'll need to use over the next few steps.

So grab one or both of them and get ready to have some perpendicular fun.

☐ **Step 17 - Fuselage Assembly (F6)**

Since you should still have the port sheeting in front of you, locate F6 from BP6 and glue it in position at the rear of the fuse sheeting. Make sure it is 90° to the sheeting and the tab is fully inserted into the sheet's pre-cut slot.

☐ **Step 18 - Fuselage Assembly (F5)**

Locate F5 from BP6 and glue it in position, making sure it is 90° to the sheeting and the tab is fully inserted into the sheet's pre-cut slot.

☐ **Step 19 - Fuselage Assembly (F4)**

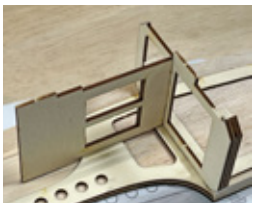
Locate F4 from LP4. *Before you say anything, yes it's slightly different than what's pictured here as it now has a center strip with a center tab.* No worries - just glue F4 in place shown here, again 90° to the side sheeting.

☐ **Step 20 - Fuselage Assembly (TR1, TR1A)**

Locate TR1 and both TR1As from LP4. The TR1A's are both glued the same side of the tray, as shown here. This side will be hither-to and forevermore referred to as the TOP of the tray for future reference.

☐ **Step 21 - Fuselage Assembly (TR1)**

Now it's time to mount the TR1 from the previous step into the fuselage.



Now, bear with me. I have changed a few things (for the better) in the production kits, and again this photo won't match as it shows F3, not F4 - but it does give you an idea of what to do.

So, that being said, TR1 mounts into the side of the fuselage, top side towards the top of the fuselage, and it's tab into the slot in F4. Yup, this photo shows it going in to F3, but it's now F4 - same idea, just flipped to mount further back in the fuselage.

☐ **Step 22 - Fuselage Assembly (F3, F3A)**

Locate F3 from LP4 and two F3As from LP1. The F3As are stacked up and glued to the bottom of F3, as shown here. Make sure they are perfectly aligned, and try to keep glue out of the pre-cut hole in the F3As.

☐ **Step 23 - Fuselage Assembly (F3)**

The F3 assembly from the previous step is now installed. ***Again, this photo is the same incorrect one from step 21, but it does show the proper installation of F3 - just ignore the tray.*** See how the F3As are at the bottom, and oriented towards the front of the fuselage. Do the same for yours while gluing it in place and all will be good. Make sure its 90° to the fuselage side.

☐ **Step 24 - Fuselage Assembly (F2)**

Locate the three F2s from LP1 and LP4. These should all be glued together, stacked neatly and perfectly on top of each other. And to make things easier down the road, make sure that the etching is visible on both sides. Epoxy is best for this, as this is the glow engine firewall and requires strength. Clamp up everything and allow it to cure completely.

Once cured, install F2 into the fuselage, again making sure it's 90° to the fuselage side.

Again, epoxy is the way to go here.

☐ **Step 25 - Fuselage Assembly (Nose Gear Block)**

Now might seem like a strange time to install the nose gear block, but actually it's the perfect time. To the right is a photo of how tight things would be if you chose to install it later, so why not make things easy? Locate the nose-gear assembly from the hardware bag. What you'll need are the 4 mounting screws, the 4 washers, 4 lock washers, and the 4 t-nuts. *Forget about the gear wire and the other parts for now. We'll worry about them later on in the build.*

On the bottom of the firewall are two etched lines. These are to aid in the location of mounting the nose gear block. Position the block so it's about an 1/8" above the bottom of the firewall, and so the mounting holes are lined up with the etched firewall lines. Mark the position of these 4 holes and drill through the firewall. Mount the block to the ***BACK*** of the firewall using the 4 mounting screws, t-nuts and washers from the nose gear bag.

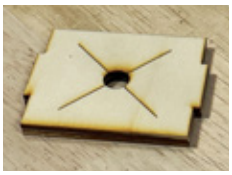
☐ **Step 26 - Fuselage Assembly (WH5)**

Locate the four WH5s from LP2. These should all be glued together, stacked neatly and perfectly on top of each other as shown here. Epoxy is the choice here. Clamp these together until the glue cures.

☐ **Step 27 - Fuselage Assembly (WH5)**

Once cured, the WH5 assembly should now be installed into the pre-cut slot of the fuselage side. Make sure it's fully inserted and 90° to the sheeting as shown.

☐ **Step 28 - Fuselage Assembly (F1, electric only)**



If your powerplant of choice requires a battery to turn, then locate two F1s from LP2. These should be glued together, stacked neatly and perfectly on top of each other as shown here. And to make things easier down the road, make sure that the etching is visible on both sides.

Epoxy is the choice here. Clamp this together until the glue cures.

☐ **Step 29 - Fuselage Assembly (F1, electric only)**

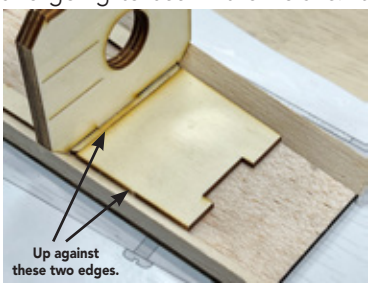
If your powerplant of choice requires non-liquid nourishment for power, then take the F1 assembly from the previous step, and the mounting bracket from the motor you've purchased.

Attaching your mount is a fairly straight-forward thing - drill 4 holes and bolt it in place when the time is right. However, you need to take a little time to get the mount in the right spot.

For electrics with a typical "X" mount, the lines on F1 should be all you need. Center up the mount so the etched lines show through the four mounting holes in the "X" plate, and that should center everything on the center hole. Then mark the holes to be drilled

on to the firewall with a pencil. Drill through the firewall with the appropriate sized bit and "Bob's your Uncle", as they say.
If your mount is held in with t-nuts on the back side, go ahead and get those mounted in place as well. Then remove the motor mount for now.

☐ **Step 30 - Fuselage Assembly (FS7, electric only)**
If your powerplant of choice requires sipping voltage to create power, then locate both FS7s from LP1.
Now here's where you need to do a little thinking, measuring, and possibly cutting. Here's why.
I have no idea what motor you're going to use in the Polaris. It might be a simple low power cruiser, or it could be an amp monster that will set the sky on fire. Because of this, you'll need to determine the proper distance from the firewall to the front of the fuselage.



As it comes, the FS7 should be the perfect length for most brands of motors which put out the same power as a typical .46 glow engine - the same power as we demo on our flight videos. However, if your motor is bigger, and hence longer, you'll need to figure that distance, then trim both FS7's to the proper length.
Once you have that figured out, one of the FS7s should be glued in place as shown here - up against the interior FS5 sheeting and between the triangle stock pieces. The matching FS7 needs to be glued inside the other fuselage sheet to match.

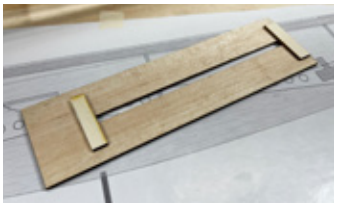
☐ **Step 31 - Fuselage Assembly (FS7, electric only)**
If your powerplant of choice requires hooking up some wires to a fancy speed controller gizmo, then...
locate the F1 assembly and glue it into place. If you've installed t-nuts, make sure they face the rear of the fuselage. Also, this electric firewall should be at 90° to the fuselage sides, and use some more of that epoxy stuff for strength.

This concludes the electric portion of our program, for now...

☐ **Step 32 - Fuselage Assembly (fuselage side)**
Now it's time to grab the starboard fuselage side and install it to the frame you've been creating.

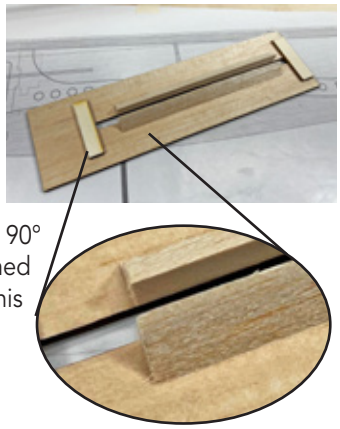
This is going to take some time and because of this, quick drying glue might not be your friend here. All of our prototypes were assembled with medium CA, but your mileage may vary greatly. ***IT IS VERY STRONGLY SUGGESTED THAT YOU DRY FIT THIS TOGETHER BEFORE EVEN THINKING ABOUT APPLYING A DROP OF GLUE.***
All the former's tabs should fit completely into the pre-cut slots in the fuselage side. Everything should be nice and snug, and you might have to sand in a few places to make that happen.
When you're sure you have everything as it should be, then, and only then get out the glue. Remove the starboard side, apply glue where needed and attach the side. Remember to use epoxy around the firewalls and the wing hold down blocks (WH5 assembly).

☐ **Step 33 - Fuselage Assembly (FS6, FS6B)**
Locate FS6 from BP5, and both FS6Bs from LP4.



Don't cut out either of the two pushrod exits yet - as you probably don't know which one is correct. Just leave them in for now. The FS6Bs are both glued to the same face of FS6, up against each end of the vertical fin cutout, and centered side-to-side on FS6.

☐ **Step 34 - Fuselage Assembly (FS6)**
Now, use a little bit of left-over 3/8" triangle stock to make internal supports for the vertical fin, similar to those shown here - each roughly 6" long.



These are glued in place, so they are perfectly lined up and centered on the slot in FS6. The 90° sides of the strips should be aligned against the slot as shown in this magnified pic.

☐ **Step 35 - Fuselage Assembly (FS6)**
FS6 is now glued in place on top of the fuselage, smooth side outward. Note the orientation of the pre-cut slot - towards the nose of the fuse. Also, it should be centered side-to-side and flush with rear former (F6).

☐ **Step 36 - Fuselage Assembly (top sheeting)**
Now the top of the fuselage is sheeted - *cross sheeted, that is.*
Using the uncut sheets of 1/8" balsa, you'll use this to start the sheeting on the top of the fuselage.
Start at the front of FS6 you just attached and work your way forward to the front of the fuselage - a piece at a time. Hold the sheeting against the fuselage, making sure the grain is cross-ways. Mark, cut and glue the first section of sheeting in position. Using this same technique, work your way forward, one piece at a time, until you get close to the nose. Then you'll have to trim a piece to fit the remaining distance.
Be careful to waste as little of the sheeting as possible.

☐ **Step 37 - Fuselage Assembly (rudder pushrod)**
Here's another spot where you need to do some of that thinking, and planning stuff.
As I have no idea on how you're going to outfit your radio system in your Polaris, I've made FS6 so you can have the rudder pushrod exit out of either side of the vertical fin. This is the time to figure that out, as you'll cut out the pushrod exit you want to use, and glue the other shut with some medium or thick C/A.
To figure this out, it might be a good time to temporarily mount

your rudder servo in TR1. Plan on where the rudder pushrod and nose gear pushrod should go. Remember that the nose gear and rudder need to work together - so they both give you "left" or "right' when you ask them to via your transmitter.

When you've figured that out, and if you're using a flexible pushrod, such as Dubro's Lazer rods, now is a good time to route the outer housing through the fuselage, and glue it in place.

Located on LP2, are FGs - who's sole purpose in life is to give gentle love, support and guidance to these tubes. Shown here is a sample of how they could be used to attach and support the tube passing through the formers. Cut, trim, and modify the FGs as needed for your setup.

☐ **Step 38 - Fuselage Assembly (aft bottom sheeting)**

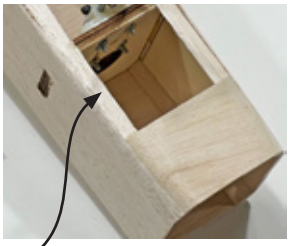
Well, I do declare, it's now time to sheet the bottom of the fuselage - *cross sheeted, that is.*

Using more of the uncut sheets of 1/8" balsa, you'll use this to start the sheeting on the bottom of the fuselage.

Start at the rear of the fuse and work your way forward to the trailing edge of the wing saddle - a piece at a time.

☐ **Step 39 - Fuselage Assembly (fore bottom sheeting)**

Before tackling this next step, you need to ask yourself "Am I electric or am I glow?".



If glow, you will continue cross sheeting the bottom of the fuselage from F2 to the front of the sheeting.

However, if you have more of an electric personality, you might want to leave the area between F1 and F2 open, as a "cheater hole" allowing the cool, crisp, fresh air to enter the fuselage, lofting over your ESC and batteries and keeping them cool as you fly through the air.

☐ **Step 40 - Fuselage Assembly (sanding)**

Remember those amazing radius gauges that we talked about back on page 5? Well, its time to put at least one of them back to work, this time as a template to help in rounding the fuselage.

Yup, it's fuselage sanding time. Of course, the amount you choose to round the fuselage corners are up to you. Maybe you want the squared off look, maybe just a hint of curvaceousness, or maybe you want the beautiful, maximum roundness shown on our prototypes.

BUT BEFORE YOU START SANDING - A WARNING... DO NOT SAND THE AREA ON THE BOTTOM OF THE FUSELAGE BETWEEN THE WING SADDLE AND F2*. This is where the hatch fits and nothing will go as planned if this area is rounded off. Again, from the front of the wing saddle to F2 is a no-sanding zone - you have been warned.*

So, all that being said, get out your best sanding tools and go at it. Using a heavier grit to start (80-100) then working your way to finer grits (150-220) usually work best.

Run the gauge along the edges being sanded to check how you're doing, and remember it's always easier to take the wood off, than it is to put it back on - so patience and a little a time is the best method here.

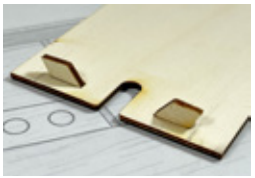
When it comes to the bottom of the fuse, from F1 or F2 to the nose, we chose to blend this area in with a gradual rounding.

☐ **Step 41 - Fuselage Assembly (vertical fin)**

Locate the vertical fin you made way back in the opening part of the build. It is now test-fitted and glued in place into the pre-cut slot on the top of the fuselage. You want a nice, snug fit that holds the fin perfectly vertical. Sand as necessary and then glue the fin in place.

You'll can also use some of the scrap 3/8" triangle as supports on each side, as we've done here. Round off the front and rear of the supports before gluing to give a better, more aerodynamic look.

☐ **Step 42 - Fuselage Assembly (H1, H2)**



Locate H1 and both H2s from LP4. The H2's are glued into the pre-cut slots in H1, as shown here. Make sure you have them pointed the correct way, and they are fully inserted into the slots while gluing.

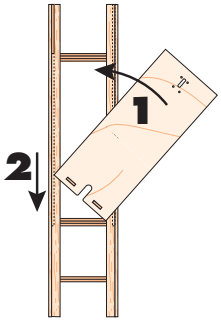
☐ **Step 43 - Fuselage Assembly (latch)**

Locate spring latch and four of the 2-56 x 5/16" self tapping screws. We will temporarily mount this latch to test fit and adjust things as necessary.

The latch mechanism should be mounted in H1's pre-cut holes, and on the same side of the hatch as the H2s.

☐ **Step 44 - Fuselage Assembly (hatch fitting)**

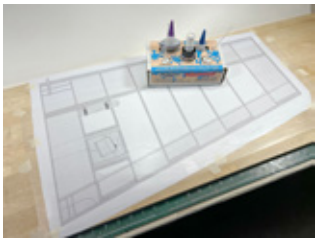
Now you can test fit the hatch to the bottom of the fuselage. The H2s will face forward and "ride on" the triangle stock inside the fuselage. The easy way to do this is to attach the hatch at an angle, then rotate it and push it forward. Push open the latch's lever to press the hatch in place, then the latch should lock in place, into the pre-cut holes in the F3As.



Because the 3/8" triangle stock can vary, you might need to lightly sand the H2s pieces to get a nice fit. Also you might need to drill out the hole in the F3A pieces to clear out glue and get a proper fit.

This completes the fuselage assembly. Set it aside and remove the fuselage plans from your building board.

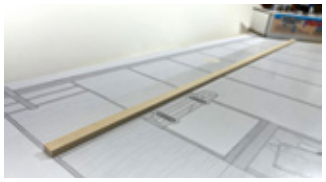
Wing construction is next. Now, the wing is built up-side-down, so the top of the wing is actually against the board, the bottom of the wing will the surface that you're looking down upon. The first wing panel we'll build is the PORT panel, so at first glance the plans may appear to be the wrong side, but trust us, this is the way. The wing plans are labeled with the same info to help you get this correct.



☐ ☐ **Prepare your work area**

Tape the PORT wing plan over your building surface and cover it with waxed paper.

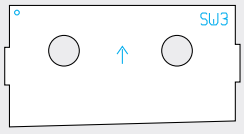
☐ ☐ **Step 45 - Wing Assembly (top spar)**



Locate one of the 3/16" x 3/8" x 36" basswood sticks. This is used as the top wing spar. Position it on the plans so it extends roughly a 1/4" past the tip. Now move to the other end and mark the stick about 1/4" past the innermost (root) rib - R1. Cut this stick to length.

Then it needs to be attached in place over the plans. We use a few drops of medium C/A to tack-glue this piece to the waxed paper to hold it in place, instead of t-pins. Use a long straight-edge to make sure it is aligned properly and is straight over it's entire length. The alignment of this spar is critical as the rest of the wing panel is based off this single piece.

Enter the WEB-LOCK construction



You'll have a bunch of these webs on BP13, LP1 and LP2. You'll use these along with the ribs over the next few steps.

These webs add massive strength to a wing, with very little weight.

These webs do four things at the same time.

1. They give you proper rib spacing with tabs that lock into the rib's pre-cut slots (our exclusive WEB-LOCK construction).
2. They hold each rib perfectly vertical without needing tools.
3. The etched face lets you easily know orientation - there's an etched circle on the edge that should face the wing root, and an etched arrow that points to the top of the wing.
4. The cutouts allow airflow between the different chambers of the wing. This is very helpful in keeping covering from bubbling up when you're applying covering later on, and when the Polaris is at the field in the boiling sun.

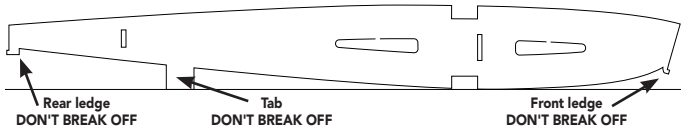
Yup, another bright idea from the warped minds of those who work at the OSMW Development Center.

Ribs and Ledges and Tabs - Oh My!

On the subject of wings, wings have ribs and the ribs in the Polaris are a bit unique - so bear with me a moment.

First off, you're going to be building the wing panels up-side-down, as I mentioned earlier.

Second, the airfoil is a somewhat unique shape. You can see more of this shape referring to the cross-section drawings on the plan sheets.



Third, there are three things that you DO NOT want to break off - as they're important. One is the tab that holds the rib at the correct angle. The other two are the front and back ledges - these hold the leading and trailing edges in place when the time comes. Refer to the diagram above for more of what I'm talking about.

☐ ☐ **Step 46 - Wing Assembly (R9, SW8)**

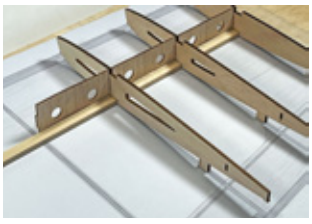
Locate R9 from BP2. Also locate one SW8 from BP13 and test fit it against R9. See how the tab in SW8 fits into the pre-cut slot in R9. This is the same technique that its used when attaching each of the ribs in the wings - watching for the etched circle and arrow.

Now that you know how these work, remove this web, apply glue along the edge touching R9, and along the bottom of the web where it contacts the bottom spar. Glue this in position to the spar as shown here, making sure the tab on the rear of the rib is flush against the building surface.

☐ ☐ **Step 47 - Wing Assembly (R8, SW7)**

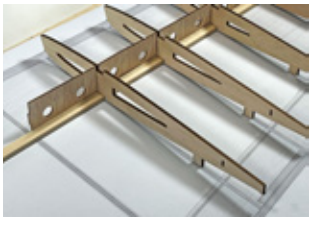
Locate R8 from BP2. Also locate one SW7 from BP13. Install these the same way as you have in the previous step. Make sure everything is straight and flat against the building surface. Again, pay attention to the etched circle and arrow.

☐ ☐ **Step 48 - Wing Assembly (R7, SW6)**



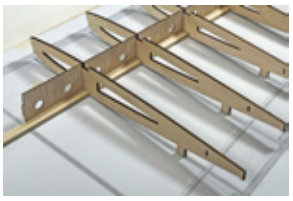
Locate R7 from BP1. Also locate one SW6 from BP13. Install these the same way as you have in the previous step. Make sure everything is straight and flat against the building surface. Again, pay attention to the etched circle and arrow.

☐ ☐ **Step 49 - Wing Assembly (R6, SW5)**



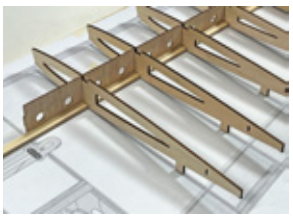
Locate R6 from BP1. Also locate one SW5 from BP13. Install these the same way as you have in the previous step. Make sure everything is straight and flat against the building surface. Again, pay attention to the etched circle and arrow.

☐ ☐ **Step 50 - Wing Assembly (R5, SW4)**



Locate R5 from BP2. Also locate one SW4 from BP13. Install these the same way as you have in the previous step. Make sure everything is straight and flat against the building surface.
Pay attention to the etched circle and arrow.

☐ ☐ **Step 51 - Wing Assembly (R4, SW3)**

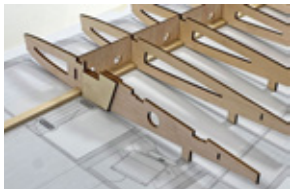


Locate R4 from BP1. Also locate one SW3 from BP13. Install these the same way as you have in the previous step. Make sure everything is straight and flat against the building surface. Again, pay attention to the etched circle and arrow.

☐ ☐ **Step 52 - Wing Assembly (R3, R3A)**

Locate R3 from BP1. Also locate two R3As from LP3. R3As are glued to each side of R3 in the area where the landing gear block will attach. Be sure they're aligned properly, as there's only one way where they are properly aligned with the rib.

☐ ☐ **Step 53 - Wing Assembly (R3)**

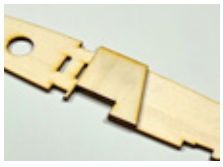


Now glue the R3 in place as shown here, making sure it's flat against the building surface and the tab from SW3 is fully inserted into the rib.

☐ ☐ **Step 54 - Wing Assembly (SW2)**

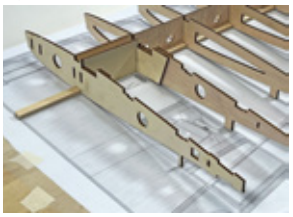
Locate two SW2s from LP1 or LP2. These are thicker webs, and you'll use two of them to start forming a "box". One goes on each side of the spar, and their tabs should be fully inserted in the R3 rib you just installed.
Try NOT to get any glue inside the "box" area.

☐ ☐ **Step 55 - Wing Assembly (R2, R2A)**



Locate R2 from LP1 and only one R2A from LP2. R2A is glued to R2 just as you did with R3, except that it's only glued to one side - the side that faces the tip rib (outer surface). Be sure it is aligned properly, as there's only one way it properly aligned with the rib.

☐ ☐ **Step 56 - Wing Assembly (R2)**



Now glue the R2 in place as shown here, making sure it's flat against the building surface and the tabs from both SW2s is fully inserted into the rib.
Again, try NOT to get any glue inside the "box" area.

☐ ☐ **Step 57 - Wing Assembly (SW10-SW16)**

Located on BP13 are the rear webs (SW10-SW16) that need to be installed now. These are installed into the pre-cut slots on the rear of the ribs.
Starting with the tip rib (R9), install SW16, paying attention the orientation using the etchings to get them all right.
One at a time, glue each of the webs in place until you've installed all the way to SW10, as shown here.

☐ ☐ **Step 58 - Wing Assembly (SW1)**

Located on LP1 and LP2 are SW1s. You'll need two of them and they're glued to the R2 rib as well as the top spar.
You can use one of the R1 ribs to help in holding them in place, but don't glue the R1 in place - just use it to hold the webs correctly.
Try not to get any glue into the "box", as before.

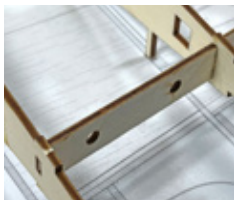
☐ ☐ **Step 59 - Wing Assembly (WH1)**

Locate two WH1s from LP1. These are glued in place into the front slots of R2, as shown here. Pay attention to the orientation, noting the etching on the WH1s

☐ ☐ **Step 60 - Wing Assembly (R1)**

Locate R1 from LP1. This is glued in place with the tabs from the WH1s and SW1s fully inserted into the pre-cut slots in R1. Make sure R1 firmly against the building surface and 90° to that same surface. Also it needs to be straight along it's entire length.

☐ ☐ **Step 61 - Wing Assembly (SW9)**



Locate one SW9 from LP2. Test fit this first, as you'll need to sand a bevel in the tab that fits into R1 for a good fit. When satisfied with the fit, remove it, apply glue and make sure SW9 is properly positioned while the glue cures.

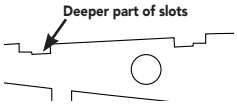
☐ ☐ **Step 62 - Wing Assembly (LG1, LG2)**

Locate one LG1 from LP1 and three LG2s from LP1 and LP2. Also locate one of the pre-bent main gear struts from the hardware bag.
The idea here is to perfectly glue the three LG2s together, all stacked up, then top it with the LG1. By inserting the main gear into the pre-cut holes, it helps hold all of them in place.
Use ***epoxy*** to glue them all together, but try to keep glue out of the slot in LG1, and don't glue the main gear to the finished LG block.

When the glue has cured, then glue this completed block into the wing, fully inserted into the cutout in R2 and R3 ribs. The flat end should be flush against the inner edge of R2 as shown in this photo. ***Epoxy is the proper choice here.***

☐ ☐ Step 63 - Wing Assembly (servo hatch rails)

Locate one of the uncut 3/16" x 3/8" x 36" basswood strips. Cut two 3-1/4" lengths to form the servo hatch rails - *set the remainder aside to use as the bottom spar later on.*
These rails will be glued into the pre-cut notches in R2 and R3, as shown here. Note that they should be pushed into the deeper parts of the slots.



Glue these rails in position, making sure they are centered on the ribs and pushed completely into the rib's slots.

☐ ☐ Step 64 - Wing Assembly (SH2)

Locate two SH2s from BP9. These will be glued into the open part of the same slots in R2 and R3, as shown here.
When gluing, make sure they are centered on the ribs and pushed completely into the rib's slots.

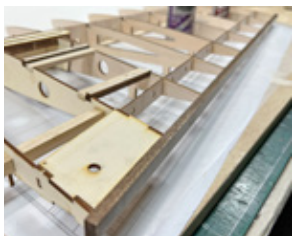
☐ ☐ Step 65 - Wing Assembly (WH2)

Locate WH2 from LP3. This is glued in place between R1 and R2, on the back of the ribs. The notches in each rib will allow the tabs in WH2 to fit into place. When in place, it will sit proud of the rib's surface by 1/16" - and that's by design. Glue this piece in place.

☐ ☐ Step 66 - Wing Assembly (TE1, TE2)

Locate TE1 from BP9 and TE2 from BP10.
These are glued together to form the trailing edge. Place these pieces against a straight edge when gluing to assure they form a straight piece.

☐ ☐ Step 67 - Wing Assembly (trailing edge)

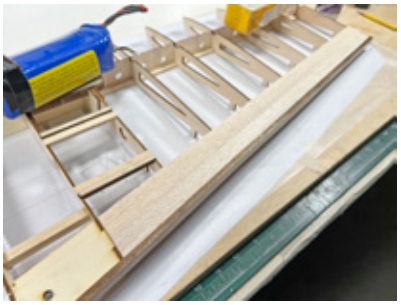


The trailing edge is now glued in place against the rear of all the ribs. Note this piece tapers along it's length, so the wider end will be at R1, the narrower at R9.
It should also rest on all of the little ledges that I warned you not to break off. Glue this in place, centered on the wing - a little should protrude from each end.
Also if this piece bows a little, you can apply a little pressure as needed to hold it in position as it should easily bend back into place with a little force.

☐ ☐ Step 68 - Wing Assembly (R2B)

Locate R2B from BP1. This is glued on to the outer face of R2, between the trailing edge and the rear web.
It should also be centered on the web and trailing edge, making it a little "short" compared to the WH2 you installed earlier. This piece is simply a shoulder (or a ledge if you will) that will help hold the outer sheeting in place in the next step.

☐ ☐ Step 69 - Wing Assembly (rear sheeting)



Locate one of the uncut 1/16" x 4" x 24" sheets - not the 36" - *the shorter 24" sheet.*
Measure and cut a 1-3/4" x 24" strip from this sheet.
Now this is glued on to the back of the wing, up against the trailing edge and WH2.
Make sure it glued to each of the ribs and is flat along it's entire length as shown here.
Note we weighed down the wing panel during this step to guarantee that nothing moves.

☐ ☐ Step 70 - Wing Assembly (WS5)

Locate WS5 from BP12 or BP14. This is glued in place over R8, R9, and up against the trailing edge sheeting you just installed. The outside edge should be flush with R9.

☐ ☐ Step 71 - Wing Assembly (WS2)

Locate WS2 from BP11. This is glued in place over R1, R2, and up against the WH2 and trailing edge sheeting. Note that it also has a cutout for the servo rails. The inner edge should be flush with R1.

☐ ☐ Step 72 - Wing Assembly (LE1, LE2)

Locate LE1 from BP9 and LE2 from BP10
These are glued together to form the leading edge. Use a straight edge when gluing to assure this forms a straight piece. Then, just as you did with the trailing edge, this piece is glued to the front of the ribs, resting on each of the ledges.

☐ ☐ Step 73 - Wing Assembly (create dihedral box)

Now it's time to cut-away the center of the R1 and R2 ribs. We've shown before and after photos to help show what needs to be done.

Before cutting

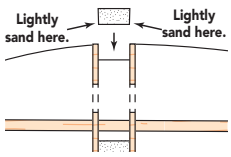
After cutting

Before cutting this area away, make sure that the webs are securely glued to the ribs on the outside of this area - not the inside. This way things won't move as you cut.
After cutting, make sure that the inside is completely clean and smooth, as this will form 3 sides of a box where the dihedral brace will slide in to. The cleaner/smoother it is now, the easier it will be to slide in the dihedral brace when it's time.
Take your time and use a gentle touch in this step as you don't want to cut/sand/file more than you should, nor do you want to damage the webs as it could weaken the wing or cause a misalignment.
Note that if you have a Japanese saw, it is the perfect tool for this job. These saws don't have the traditional offset in the teeth, so they can cut smoothly, up-against edges like the webs.

☐ ☐ **Step 74 - Wing Assembly (bottom spar)**

Locate one D2 from LP3 and the 3/16" x 3/8" basswood strip leftover when cutting the servo rails. Measure and trim the bottom spar to length, again, leaving about 1/8" extra past the root rib (R1).

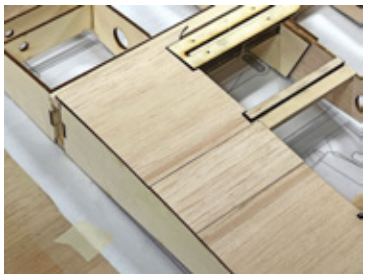
It is HIGHLY advised that you take a test run on installing this lower spar before any glue gets out of the bottle.



First lightly sand the edges of the spar's bottom face as shown in the drawing to the right. This will help the spar slide in easier.
Now start pressing it in place, starting at the tip rib, and working your way towards the root a little at a time. This will be a tight fit and might require "wiggling" the spar from side to side to slip in-between the webs. Be sure to press the spar completely into the slot in each rib, making it flush with the webs.
Once you get to the open area between the R1 and R3 ribs, you'll use the single DH2 as a spacer. ***Note that it is NOT glued in at this point*** - just used as a spacer to keep the correct height for the spar.
Gluing this spar in correctly will take a bit of time, so we recommend against using an instant setting glue. If you are using CA, use a thicker formulation that gives you a bit of working time.
Once the spar is in place, remove the DH2, then wick thin C/A in each of the spar and web joints (front and back), along the entire length of the spar.
When fitting the lower spar in the area of the dihedral box, be careful not to drip excess glue into the box formed between R1 and R2 ribs.

☐ ☐ **Step 75 - Wing Assembly (WS1, WS8)**

Locate one WS1 and WS8 from BP11.
WS1 is fitted on top of the R1 and R2 ribs, up against the landing gear block and resting part way on the bottom spar. Glue this in position.
Then you'll trim WS8 to fit in the gap between WS1 and WS2, as shown here. Glue it in position and make sure it's also glued to the sheeting.



☐ ☐ **Step 76 - Wing Assembly (leading edge sheeting)**

Locate one of the uncut 1/16" x 4" x 36" sheets - ***the longer 36" sheets***, not the shorter 24".
Trim this to length, similar to the way you cut the spar to length. This sheet should extend roughly an 1/8" or so past the tip & root ribs.
Then you'll need to trim the width, as the wing tapers from the root to the tip. You'll want the sheeting to be up-against the leading edge, and up against the sheeting you've already applied, partially covering the spar.

Apply glue along the edge that will be glued to the back of the leading edge. Press this in place, making sure it's secured along it's entire length.
Once that glue has cured, then apply more glue to edge of each of the ribs, the top of the webs and to the front edge of the spar.
Slowly press the sheeting in place, evenly working your way from the leading edge, back to the spar.

☐ ☐ **Step 77 - Wing Assembly (WS4)**

Locate WS4 from BP11 or BP14. This is placed over R8 and R9, between the leading edge and WS5 sheeting already installed.
You will have to trim this slightly to length, as we've supplied a longer piece than needed.

☐ ☐ **Step 78 - Wing Assembly (cap strips)**

Cut into the BP12 and BP13 sheets are 1/4" wide strips of 1/16" balsa. These are to be used as the cap strips.
As there are different lengths of pre-cut strips, use the shortest one that's appropriate for each rib, R4 through R7. Each strip should be centered on the rib and run from the rear of the leading edge sheeting to the front of the trailing edge sheeting.

Measure, cut, and glue each strip in position.
Then you'll also piece together a few smaller sections to apply a cap strip to R3, working around the servo rails and the landing gear block.

Now your wing panel should look a lot like this.

Take a breather, and when ready, remove this panel from the building surface and we'll work on the top side.

☐ ☐ **Step 79 - Wing Assembly (tab and ledge removal)**

If you haven't already, remove the wing from the building surface and flip it over so you can work on the top.
Take a bit of time to carefully remove tabs from all of the ribs. Also take the time to cut-away the tiny ledges from the front and rear of each rib. Be sure that when cutting, you're removing just enough material to continue the curvature of each wing.
Blobs of glue normally form around the front and rear ledges, so take the time to remove them all.

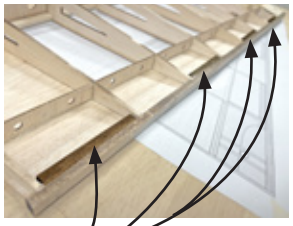
☐ ☐ **Step 80 - Wing Assembly (WH4)**

Locate two WH4s from LP2. These are glued to each side of the cutout in WH2, as shown here. Make sure they're also glued to the trailing edge and to the web.

☐ ☐ **Step 81 - Wing Assembly (WH3)**

Locate WH3 from LP3. This is glued in place between R1 and R2, on the back edge. The notches in each rib will allow the tabs in WH3 to fit into place. When in place, it will sit proud of the rib's surface by 1/16" - and that's by design. Glue this piece in place, pre-cut hole toward R1.

☐ ☐ **Step 82 - Wing Assembly (HS)**



Locate eight HSs from BP2, BP4 or BP7. These are simply reinforcements for hinging later on. Note the spots where these pieces should be installed on the plans, stacked one on top of the other to form a 1/4" thick piece. They're then centered between their respective ribs and glued to the trailing edge as shown here.

☐ ☐ **Step 83 - Wing Assembly (rear sheeting)**

Locate the sheet of uncut 1/16" x 4" x 24" balsa - the one you trimmed the rear sheeting from earlier in the build.
Measure and cut another 1-3/4" x 24" strip from this sheet.
This is glued on to the back of the wing, up against the trailing edge and WH3.
Make sure it's glued to each of the ribs and is flat along it's entire length as shown here.

☐ ☐ **Step 84 - Wing Assembly (dowels)**

Locate 1/4" dowel from the hardware bag. You'll need to cut a piece that's 2-3/4" long. Make a mark 1/4" from one of the ends.
Then you'll need to round the other end - either by hand, or do it like I do - chuck up the dowel in a drill spin and it like a little lathe. Use sandpaper to quickly round off that end.

Winner, Winner!
Kung Pao Chicken for dinner!

☐ ☐ **Step 85 - Wing Assembly (dowels)**

Now it's time to mark and drill the leading edge to accept the wing hold dowel.
Using the two 1/4" pre-cut holes in the already installed WH1s, mark and drill a small pilot hole in leading edge. ***It should be perfectly in line with those two holes, both vertically and horizontally***. Enlarge the holes gradually with a reamer, or by stepping through various drill bit sized up to 3/16", then finally to 1/4". Take it slow and remember that thing about it being easier to remove wood than put it back on.

Insert the dowel into the leading edge, pushing it through both WH1s and until the 1/4" mark you made on the dowel is even with the back side of the rearward WH1. Glue the dowel in place on the inside of where it touches everything - not on the outside of the leading edge, as you'd only have to sand that away later.

☐ ☐ **Step 86 - Wing Assembly (leading edge sheeting)**

Now it's time to mark, cut, and install the wing's top leading edge sheeting. Locate another of the uncut 1/16" x 4" x 36" sheets - the longer 36" sheets, ***not the shorter 24".*** Trim this to length - it should extend roughly an 1/8" or so past the tip and root ribs.
Then you'll need to trim the width, just as you did on the bottom leading edge sheeting. You'll want the sheeting to be up-against the leading edge, and come back to cover roughly 1/2 of the spar. Make sure that when you measure this you take into account the curvature of the wing's upper surface.

Apply glue along the edge that will be glued to the back of the leading edge. Press this in place, making sure it's secured along it's entire length. It will be sticking up very similar to what's in this photo.
As the sheeting we get can vary in density, it's time to call upon the wonders of glass cleaner - specifically cleaner with ammonia in it. Liberally spray the cleaner on sheeting - top side only. Spray along the entire length, soaking the surface and let it start to work, loosening up the fibers. Actually you should be able to watch it work quite quickly.
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, you can glue it in position.
Glue it to the front of the ribs first, then to more of each rib and finally to the top spar. Slowly press the sheeting in place, evenly working your way from the leading edge, back to the spar.

☐ ☐ **Step 87 - Wing Assembly (WS4, WS5)**

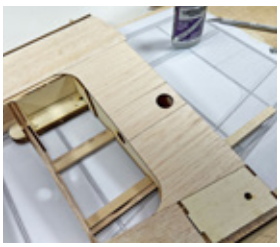
Locate another WS4 and WS5 from BP11, BP12 or BP14.
These are glued together over R8 and R9, between the front and rear sheeting, just as you did on the bottom side of the wing. And just as before, you will need to trim WS4 length, as it's purposely a little long.

☐ ☐ **Step 88 - Wing Assembly (WS3, WS3A)**

Locate WS3 from BP11 and WS3A from BP14.

Glue WS3A in place, perfectly centered over the cutout in WS3. Also make sure to rotate WS3A so it's grain is cross-ways to WS3, as shown here. Gives this more strength which will be needed when fishing servo wires through the wing later on.

☐ ☐ **Step 89 - Wing Assembly (WS3, WS6, WS7)**



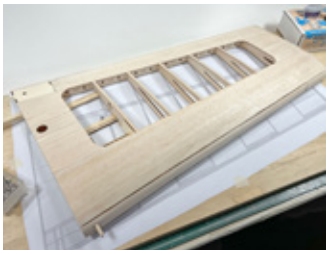
Locate the WS3 assembly from the previous step, as well as WS6 and WS7 from BP11.
These are all glued in place over the R1 and R2 ribs as shown here.
Note the orientation of the cutout in WS3 - towards the root rib, and with WS3A on the inside (not showing).
You'll need to trim WS6 as it's purposely a little long.

☐ ☐ **Step 90 - Wing Assembly (cap strips)**

Locate more of the cap strips pre-cut into the 1/16th sheeting. Just as on the bottom, you'll now cut and apply cap strips to the top edges of the R3 through R7 ribs.
As there are different lengths of pre-cut strips, use the shortest one that's appropriate for each rib. Each strip should be centered on the rib and run from the rear of the leading edge sheeting to the front of the trailing edge sheeting.
Measure, cut, and glue each strip in position.

☐ ☐ **Step 91 - Wing Assembly (T1)**

Locate two T1s from BP4. These will be used as the wing-tips.
Before installing them, you'll need to grab your sanding block and it's time to true up the end of the wing. Carefully sand away any excess sheeting, leading and trailing edge stock, or any of the spar that protrudes past R9.
R9 should be a smooth, flush surface. When smooth, glue both T1s in place, one stacked on top of the other - and both so beautifully in line with R9.



This concludes the Port wing construction of our program. Take another breather and see what you've created - something that hopefully looks just about like this.

Now, place this wing panel aside in a place where all will be amazed by its beauty, as it is of no use to you at this particular moment.

Remove the Port wing plan, and tape the STARBOARD plan in position, with some new, clean, fresh, lovely waxed paper.

*Now set your way-back machine, way, way back:
all the way back to step 45 of this manual and start building the STARBOARD wing. You'll follow steps 45-91 to complete the starboard wing panel. Once finished, then move on to step 92. Note that when building the starboard panel that many of the parts will need to be glued to the opposite side (the sheer webs, and R2A for instance). Always refer to the plans to make sure you're gluing the parts together in the correct way.*

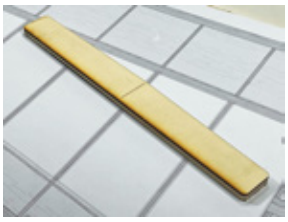
☐ **Step 92 - Wing Assembly (rear brace)**

Locate the leftover 3/16" x 3/8" basswood that you trimmed when making the top spar, and the port wing panel. You'll need to measure and cut two 6-1/2" long pieces from this, then glue them one on top of the other to form a 3/8" sq. brace.

Mark a centerline on this brace then test fit it through the square cutouts in the rear of R1 and R2. The center mark should be at the inner surface of R1 and the end just about flush with the outer surface of R2.
When satisfied with the fit, glue this in place into the port wing panel.

☐ **Step 93 - Wing Assembly (D1, D2)**

Locate D1 (1/4" ply) and D2 from LP3. *Yes, there are two D2's in your kits - couldn't be helped - you'll install just one of them. Use the other as a really bad boomerang, or maybe a coffee stirrer when you need that extra large cup o' Joe.*



Anyway mix up a little more of that gooey, sticky, epoxy stuff and glue D1 and ONE of the D2's together.
Make sure that the etched lines on each part are visible and they are perfectly aligned with each other.
Clamp this together and allow it to cure completely before moving forward.

☐ **Step 94 - Wing Assembly (join the wing halves)**

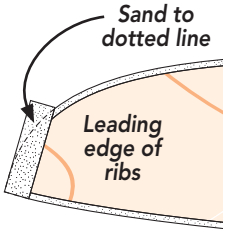
Time to get to sanding again. This time, it's truing up the root ribs (R1) on both wing panels. A large, flat sanding block is best for this as you'll need the surface to be completely flat and free of any extra sheeting, balsa or basswood sticks.
Take some time test fitting and sanding the dihedral brace as necessary to get a good fit in both wing halves. Don't take off too much, too fast. Carefully sand as necessary to make sure everything fits properly and the root ribs in each wing half are touching along their entire length when assembled into a single wing. Take your time and get a good fit that doesn't require a lot of force.
Remember you may have to file inside the boxes built into each wing half. Make sure they're smooth and the brace doesn't catch on any extra glue.
If necessary sand a little of the rear brace so it's also a good fit into the square cutouts in the rear of the ribs.

☐ **Step 95 - Wing Assembly (join wing halves)**

Test fit the wing halves together one last time and sand as necessary for a good fit.
After test fitting, join the wing halves permanently with 30 minute epoxy. Remove the dihedral brace and apply the epoxy into the pockets in each wing half. Coat the face of one root rib and also the rear brace.
Slide the dihedral brace into one of the wing halves, then slide the other wing half in place. Using a couple of clamps (or tape), hold wing halves firmly together. Wipe off any excess epoxy and remove the clamps only after the epoxy has fully cured.
Remember, any twist in the alignment of the panels cannot be fixed after the epoxy cures and will lead to a poor flying model.

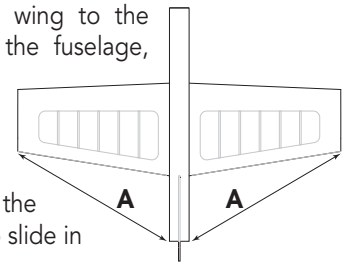
☐ **Step 96 - Wing Assembly (sanding)**

Before I set you loose with your sanding tools, I need you to take a look - a good look - at how this airfoil is shaped. It's quite unique and the brainchild of Bill Evans, the father of the Simitar family. Note the rather strange leading edge - kind-a blunt compared to a typical semi-symmetrical airfoil. You'll need to sand the top and front faces of the leading edge to get the shape. (Refer to the drawing on the previous page, or better yet - the full-size drawings on the plan sheets.)



So with all this being said, now is the time to get quite familiar with the sanding tools of your choice. Take the time to perform a good sanding of the wing, shaping the leading edge and blending it into the leading edge sheetings. Then blend the wing tips into the leading edges. 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. Pound out the extra time on those wing tips to make sure they are smooth, perfect works of art and match each other exactly.

☐ **Step 97 - Fuselage Assembly (wing mounting)**



Now it's time to offer up the wing to the fuselage. Insert the wing into the fuselage, making sure the front dowels slide smoothly into the holes in F3. If they don't fit as nicely as you'd like, don't mess with the dowels. Instead, file a bit on the holes until you get the dowels to slide in as they should.

To align the wing properly on the fuselage, place the wing in position, then allow the wing to rest in the wing saddle. The wing is perfectly aligned when the distance from the port wing tip to the rear of the port side of the fuselage is the same the distance of the starboard wing tip to the rear of the starboard side of the fuselage.

☐ **Step 98 - 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 WH2 and WH3 as a guide. Before powering up, position the drill down through these holes and only then turn on the power to drill down through WH5 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 in the center of the wing holes. This will guarantee that the holes drilled in WH5 will be 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 WH5 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. We've found this to be a very secure way of holding the wing in place for all of our prototypes, but... if you don't want to go this way, you can also use 1/4x20 t-nuts (not included). If you go that route, you may also need slightly longer bolts, but that's something you'll have to find out for yourself.

☐ **Step 99 - Fuselage Assembly (elevons)**

Locate both 2" x 3/8" x 36" balsa sheets, as these will be used to form the elevons. I say "form" because this is gonna require a bit of work on your part. Try as I might, I can't purchase pre-formed trailing edge / aileron stock at this size - the same size that Bill used on the original. So, here's how to make them:

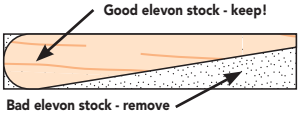
First, measure and cut them to length. You should leave about 1/2" between the inner edge of the elevon and the fuselage side. And although you're free to form them to any profile you want, the original (and our prototypes) had angled cuts that matched the outline of the fuselage and wing. So you should now have two matching, super-thick elevon pieces.

Second, from this point the elevons need to be mirror images of each other. So, that being said, designate top of each elevon with a piece of masking tape.

Third, you'll need to draw a line along the trailing edge of each elevon, 1/16th down from the top surface. I do it by making several marks along the piece, then using a straight edge to draw between those marks.

Fourth, you'll draw another line on the bottom of the elevon, 1/4" from the leading edge. The wider part of the stock will be sanded away, and to make sure I sanded in the correct place, I drew some "Xs" on the part to be removed.

Fifth, it's sanding time. Again, making sure that you're creating MIRROR images with your elevons, its' time to remove all the wood in the area inside the lines you drew. You're going for a profile that looks something like this:



Sixth, while sanding, also take the time to round off (or bevel the leading edge for hinging later on.

☐ **Step 100 - Fuselage Assembly (bringing up the rear - AC)**

Locate the four ACs in BP2, BP6 and BP8. These are glued one on top of the other, rotating the grain 90° for each layer as shown here.

These pieces make up the anterior cone, or as you may know it, the exhaust.

I would not suggest installing this just yet - it's better done once the covering is underway.

☐ **Step 101 - Assembly (sanding)**

Now you should have sanded most of the airframe already, but I haven't mentioned the vertical fin and rudder. Round the leading edge of the vertical fin as well as the trailing edge of the rudder.

Also sand bevels into the leading edge of the rudder.

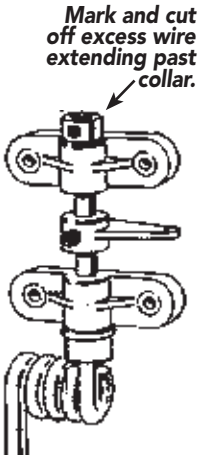
Look over everything else and make sure it's smooth and just as you'd like it to be. The idea is to spend some time caressing this awesome airframe you've created, smoothing the rough edges until it's something perfect .

What you should end up will be thing of beauty - something that looks pretty darn close to what's on the front page of this manual (but without the landing gear and canopy which I haven't told you how to install yet.)

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

☐ **Nose Gear assembly.**

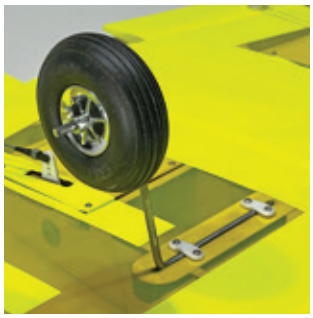
Everything you need to assemble the nose gear is in one package. Push the nose gear wire partially into the block you've already mounted in the fuselage. Slip the steering arm in place, then push the nose gear wire all the way through the block and the arm.



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 as needed, 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).

☐ **Main Gear mounting**



Locate the two main gear wires, four plastic landing gear straps and 8 of the 2-56 x 3/4" self tapping screws. Push the main gear into the wing until it's fully seated in the slot on the underside of the wing. Then place two of the plastic mounting straps over the pre-cut mounting holes in the LG blocks. Use 4 of the screws to mount the gear in place. Repeat this for the other side.

☐ **Tank Compartment fuel proofing**

If you're using a glow engine to power your Polaris, it is strongly recommended that you fuel proof the inside of the tank compartment and hatch. 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.

Power System

Installing your power system of choice is up next. Note that these are suggestions only as you might want to do things a bit differently with your power system.

Glow Power

Mounting the engine is a fairly simple thing. It would typically mount either upright or sideways (with the muffler under the fuselage. 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.

6-8 ounce tanks work well and give a nice flight time, although you might be able to squeeze some larger 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.

Regardless of the motor you are using, it should be mounted to F1, using the holes you made way back in the earlier stages of the fuselage construction.

Because of the way the Polaris is designed, you won't have to cut out any extra cooling holes. Just leave the "cheater-hole" open as we mentioned during the fuselage sheeting, and the fuselage will do the rest of the work - there's even a convenient exhaust vent right were it should be.

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!

All that's left is the rest of it.

Whether you're hinging, mounting, gluing, sanding, soldering or installing, chances are we've got a video tip to make the task easier.

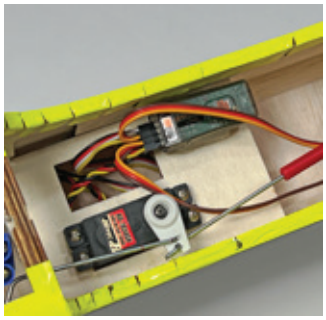
OSMW has created a series of videos to help you not only build your aircraft, but build it better. These Bright Idea videos can come in handy for some of the following steps.

Check them out today - they're FREE and we're adding to them all the time!

Visit oldschoolmodels.com/tips.htm or scan this QR code.

☐ **Servo & Pushrod installation**

Although you can install the servos and control hardware after covering your Polaris, 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.

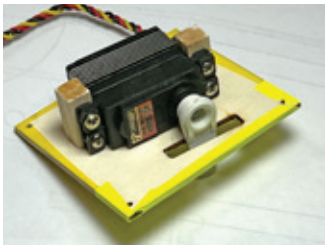


Shown here is an example of the radio gear's installation in one of the Polaris prototypes. Simple and neat. But note that the servo tray has been moved back to mount into F4, as we noted earlier. Same idea, just a little further back.

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

When mounting the elevon servos to the both SH1s (in LP2) you'll need to cut eight 3/4" lengths of the 3/16" x 3/8" square basswood scrap. Make four thicker mounting posts by laminating two pieces together then sand the ends flat.

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



On the inside of each elevon 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.

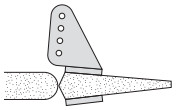
Now fit the servo hatches into position on the bottom of the wing, running the servo wires through the cutout in R2 and through the hole in the top sheeting.

Using the pre-cut holes as a guide, drill four 1/16" mounting holes into the basswood mounting rails 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). If you're going glow, 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!

☐ Control Horn installation

Now it's time to mount all of the control horns - one for each control surface. A control horn consists of the horn, it's plastic backer plate and two 2-56 machine screws - use the shorter 1/2" screws for the rudder and the longer 3/4" screws for the elevons. You'll find all of that in the hardware bag.

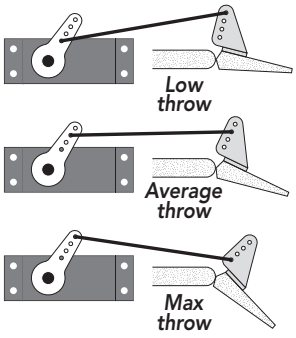


Each control horn should be mounted so it's in-line with the pushrod opening and the holes in the control horn should be in-line with the hinge, as shown in this diagram.

You'll need to carefully mark and drill the mounting holes using the control horn as a guide. Then you insert the screws and thread them into the backer plate from the other side. Tighten the screws to firmly hold the control horn in place, but not crush the wood of the control surface.

As for the pushrods, we're not going to do in-depth on how they work, as that's covered in their included instructions. Basically you'll measure and cut the pushrods to length, taking into account the length of any clevises on the end of the pushrods.

We typically have one end of the pushrod (the exposed end for the rudder) that has an adjustable clevis. The other end is usually a simple z-bend that attaches into the servo horn. Doing it this way allows fine adjustment at the field without having to get inside the plane, taking things apart.



Also, when setting up the pushrods, the various holes in the servo arm and the control horns can drastically change the amount of throw that the surfaces will have. Here's a rudimentary diagram that shows how you can remove or add throw to a surface mechanically - simply by changing the holes used.

Covering

Now it is time to cover the Polaris. 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.

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.

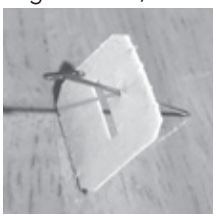
Contact Callie Graphics at this link: https://callie-graphics.com or scan the QR code.

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.

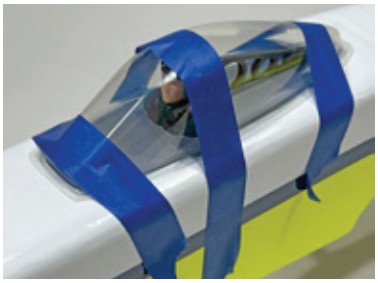


Attach Wheels

Use the included 5/32" i.d. wheel collars to hold your wheels (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 Polaris' 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 it's perimeter.

- Place it on the fuselage and see if will rest flat. If not, remove it and lightly sand the bottom lip until it's flat. 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 the included headrest (C1 and C2 in BP8) and a pilot figure (not included), now is the time to assemble those pieces, paint as needed and glue them in place.

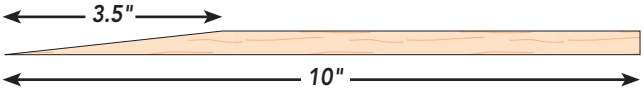
- Give the canopy a quick wash in warm, soapy water.
- If you're going to tint or paint the canopy, do this on the inside now and allow it to try.
- Use a bit of canopy glue to attach the canopy. So it doesn't move while the glue cures, hold it in place with a bit of low-tack masking tape.

Optional Battery Tray (electric only)

If your powerplant of choice requires non-liquid nourishment for power, then you might want to fashion and install this optional battery tray.

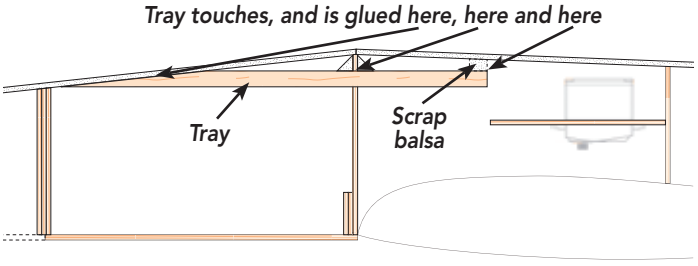
Locate one of the leftover pieces of 3/8" x 2" balsa that was cut to form the elevons. Measure and cut a piece that's 10" long. Although tight, the 2" width will work, although we narrowed it to 1-3/4" in our prototypes.

Now from one edge, measure back 3.5" inches. You need to then sand, file, or cut a bevel on this piece that matches this drawing.



Now this piece should be the proper profile to fit inside the fuselage, against the top sheeting, and resting inside the cutout in F3 as shown below. You'll need to also cut a small amount of scrap balsa to support the back of the tray.

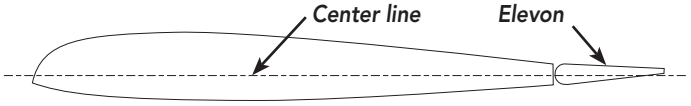
Before gluing this tray in position, attach any hook-and-loop (or whatever else you use to hold the battery in place. Easier to do it before it's inside the fuselage.



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

Very important - Add the Reflex.

Most flying wing designs require a bit of reflex - basically adding some up-elevator, or in this case, up-elevon. We've found that the Polaris doesn't need much. Basically if you add "up-elevator" so that the bottom edge of the elevon continues the bottom curvature of the wing shape, that's a pretty good place to start. Refer to this diagram to see what I'm mentioning.



Note that the plans show reflex as well, but don't use them as a setting guide - as the plans are a bit exaggerated.

Recommended Control Throws:

Elevon 3/4" up/down

Rudder 1" left/right

However, I chose a different path that I enjoyed much more. I installed Dubro's longer servos arms and chose to have maximum throws on the elevons with heavy expo to calm down the responsiveness near neutral. It made the Polaris much more responsive when I needed it, but smooth and controllable when landing, cruising, etc.

Full throw expo recommendations:

Aileron - 20% , Elevator 35% , Rudder 15%

Again, your mileage may vary.

(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.)

Please, please, please!

Check the direction that each control surface moves.

Then double check the directions.

Walk away for a while, then come back and check the directions again.

The number one cause of a crash of any brand new airplane on its maiden flight is having the wrong throw for one (or more) of the control surfaces.

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 Polaris

is 1.7" to 2.5" from the leading edge of the wing, as measured at where the wing contacts the fuselage, and you'll see this marked on the fuselage plan with this symbol.

C.G. BALANCE POINT

1.7" is the original C.G. Bill Evans recommended. It flies just fine at this balance point, but for me, it seemed a bit nose heavy. That's why I've incorporated the longer battery tray to allow me to move things rearward a bit easier. For me, moving the C.G. rearwards gave me a bit better feel and a little easier time when flying inverted.

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.

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. 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 unopened 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 .

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

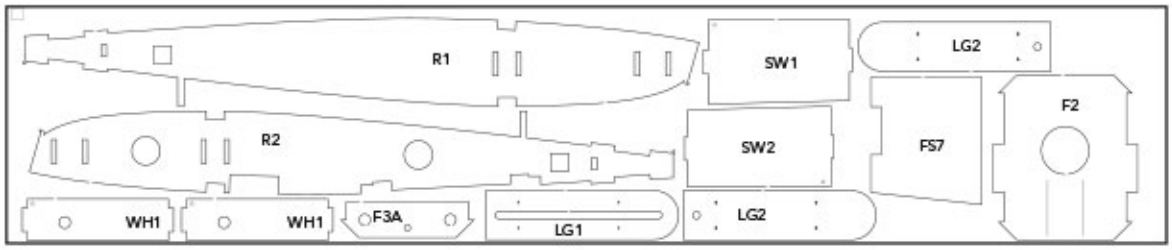
Please check out out website: www.oldschoolmodels.com

You can reach us on Facebook: www.facebook.com/oldschoolmodelworks

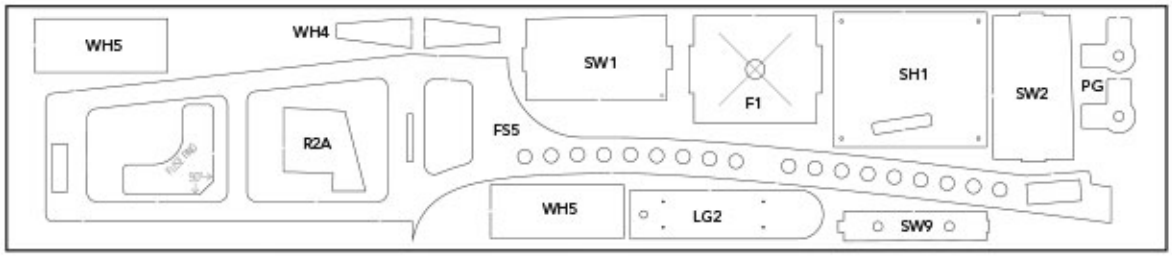
Instagram: www.instagram.com/oldschoolmodelworks/

See photos of our kits and customer builds on Flickr: https://www.flickr.com/photos/oldschoolmodelworks/

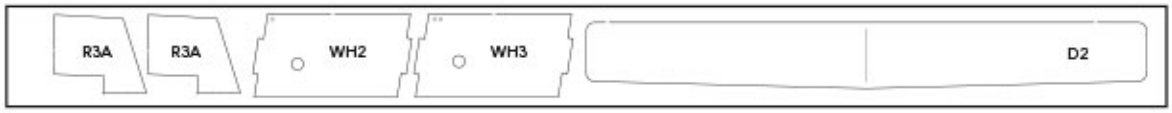
LP1
1/8" Lite Ply



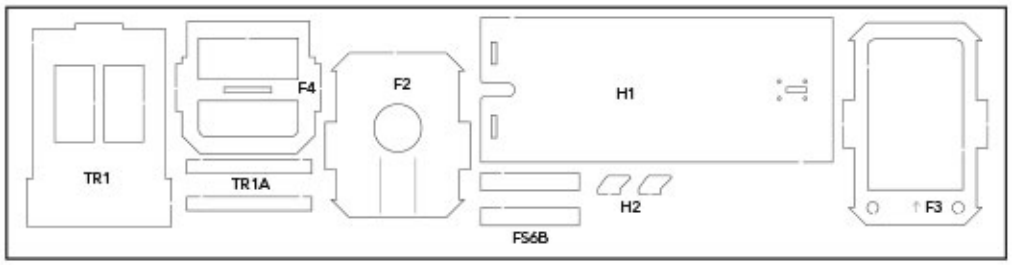
LP2
1/8" Lite Ply



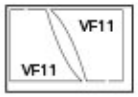
LP3
1/8" Lite Ply



LP4
1/8" Lite Ply

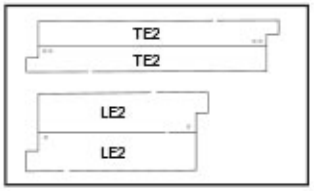


LP5
1/16" Ply

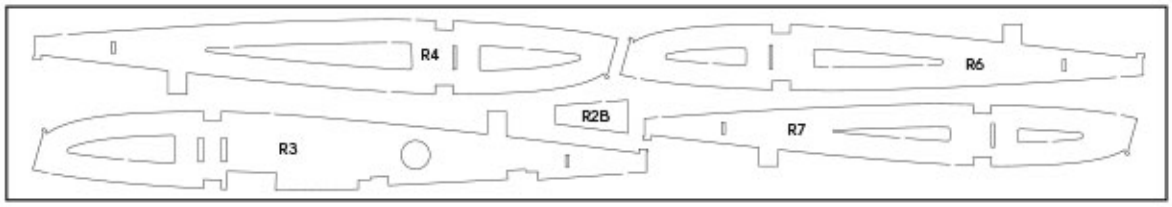


D1
1/4" Ply

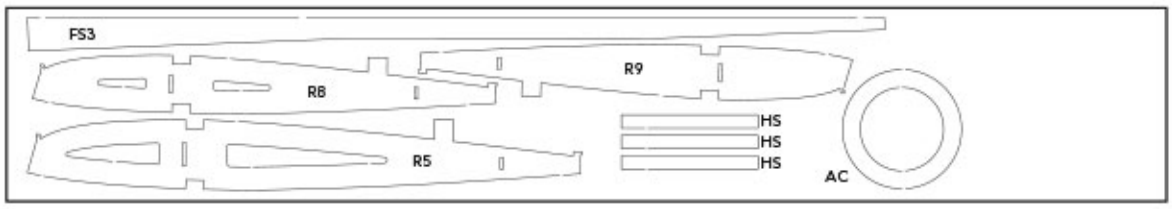
BP10
1/4" Balsa



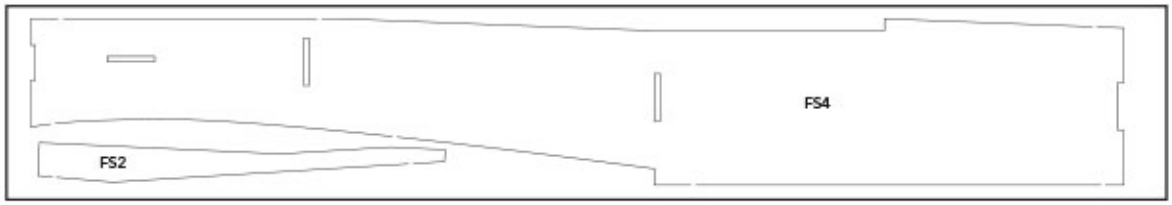
BP1
1/8" Balsa



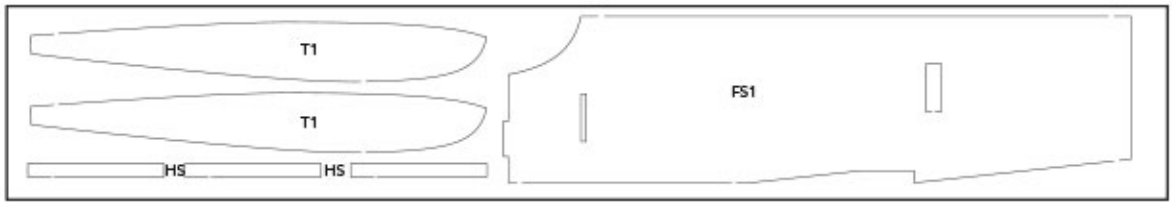
BP2
1/8" Balsa



BP3
1/8" Balsa

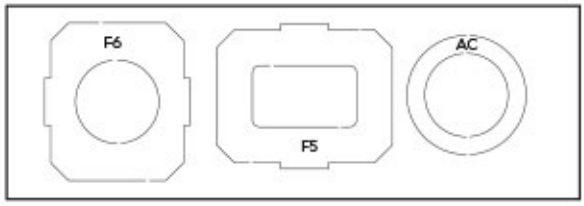


BP4 1/8" Balsa

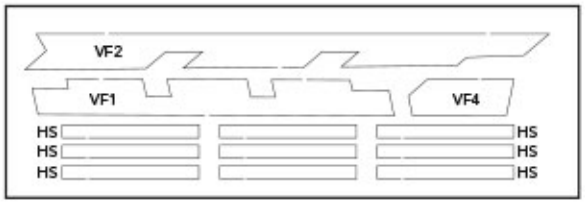


BP5 1/8" Balsa

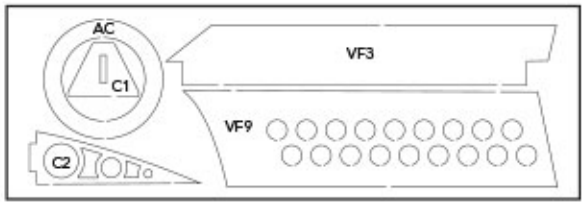
BP6 1/8" Balsa



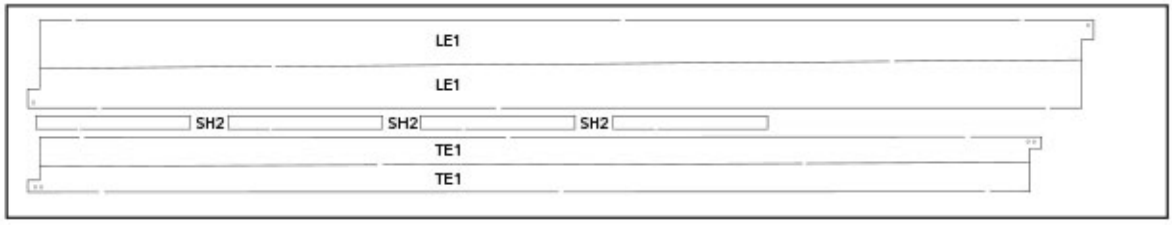
BP7 1/8" Balsa



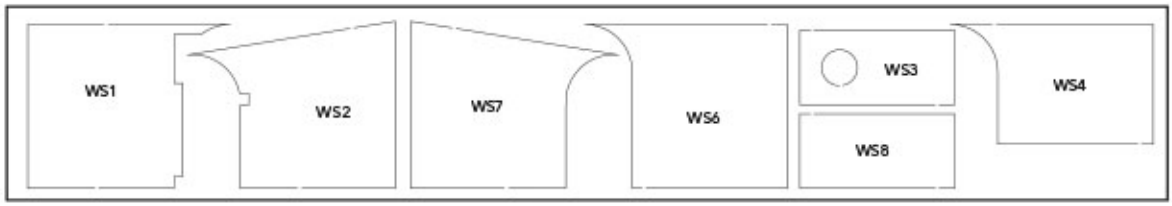
BP8 1/8" Balsa



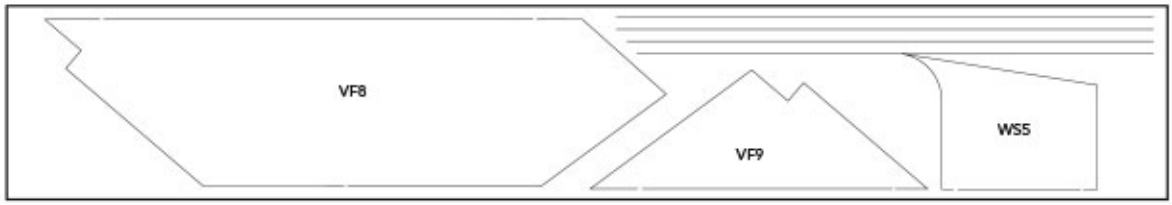
BP9 1/4" Balsa



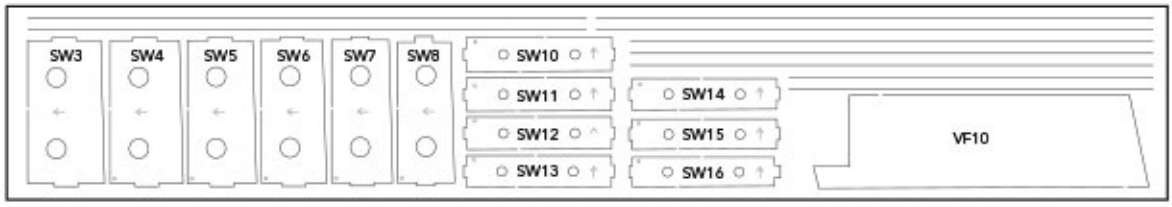
BP11 1/16" Balsa



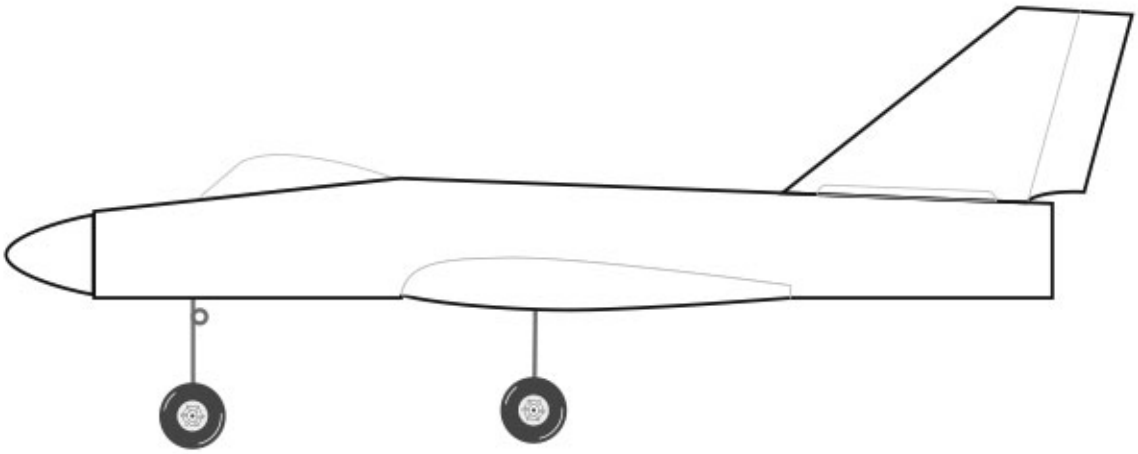
BP12 1/16" Balsa

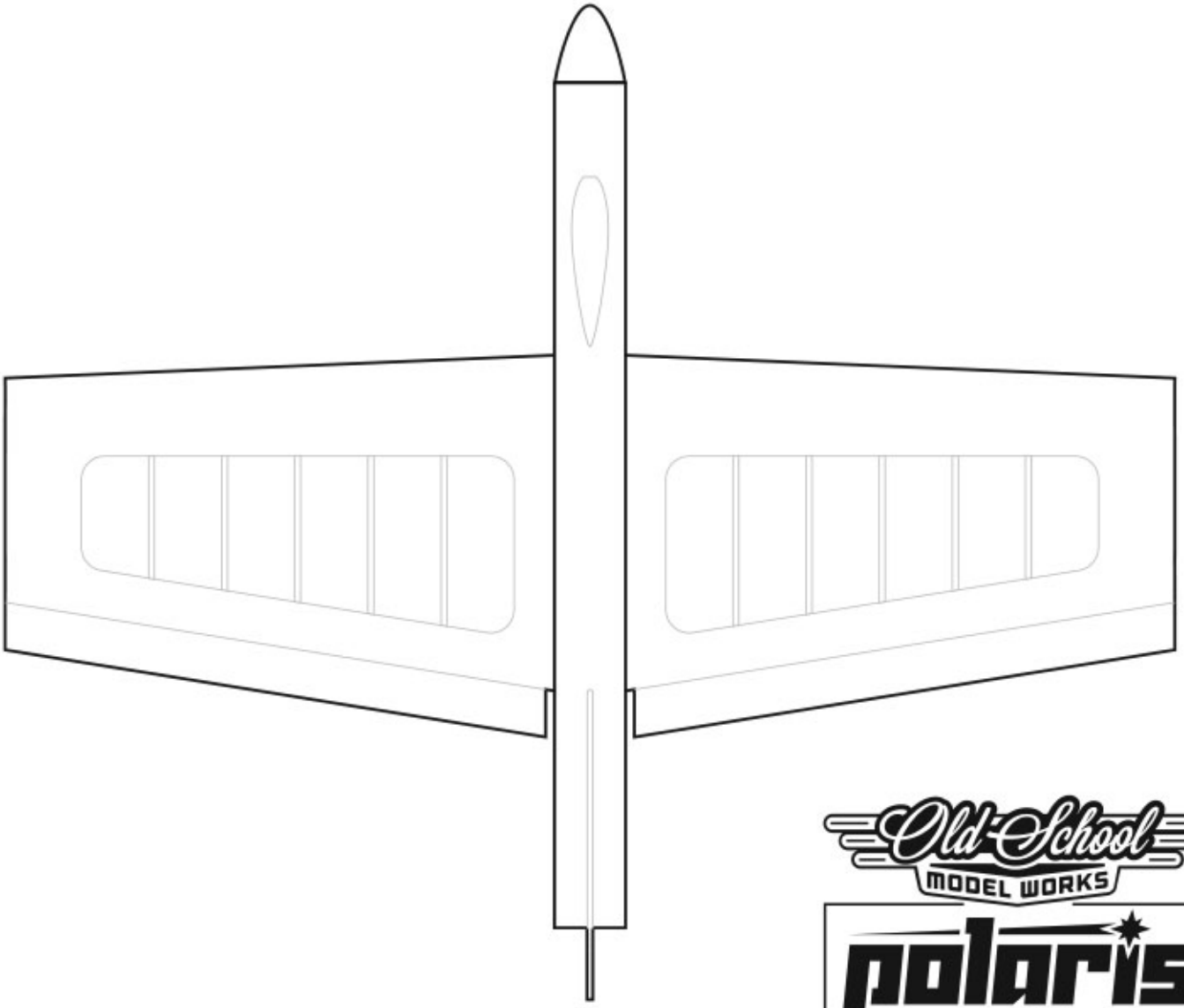


BP13 1/16" Balsa



BP14 1/16" Balsa





Old School MODEL WORKS

polaris

Wingspan: 50" • Airframe Length: 39" • Recommended Weight: 3.5-5 lbs (RTF)
4 channel radio • Power: .35-.61 glow (or equivalent electric)

Originally design by Bill Evans. Updated and drawn by M. Lanterman