



Classic Aero's 1/12 Scale Sikorsky S-38



Building Instructions

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These instructions are intended for use with the accompanying photo documentation.
The photos are referred to by number, and will aid in seeing the techniques described here.

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Building the new electric Sikorsky S-38 model

Introduction

This is the second 1/12 scale prototype kit of the S-38 from Classic Aero. It has been totally redesigned with all new sport scale plans.

The new S-38 ready to fly with lithium batteries should weigh in at 6 pounds. This is a three and half pound weight savings over the previous kit!

Some dimensions are given here to compensate for the paper inconsistencies in reproduction.

- Outer wing panel before sanding are 25.5-in.
- Wing center section is 21-in.
- Align the W-1-S ribs so the servo horn is on the inside of the booms to drive the control rods to the rudders.
- Total top wing length is 72-in., once the wing is joined.
- The aluminum tube wing joiner is replaced with the 1/4 sq. bass wood strips. This saves weight, 3-oz. The new joiner will work out better!
- Use the laser cut stab to check the boom slots in the wing center section 10-3/4 to the inside of the booms. This is critical for the parts to fit properly.
- The lower wing length is 15-1/8-in before sanding.
- The tail group is laser cut along with the boom centers. Their length is predetermined.
- The engine nacelles on the side view of the plans are shown longer than the laser cut parts are. The laser cut parts are correct. It was originally thought that the longer nacelle was needed for the Astro 05 motors, but with the weight reduction, the 020 motors will work fine with power to spare.

Please note: the original drawings are provided in a reduced format to give the scale builder added information on building a truly scale S-38 model. (additional optional accessories are available for the scale builder!) It has been perceived that most modelers want a sport scale version of the S-38.

Any questions please email me at airstream@mich.com or call 248 969 8139.

Thank you for purchasing the new 1/12 scale S-38 kit.
Its time to start building the S-38 model!

Metal and wood Brackets

After much effort was made on water jet cutting the metal parts and considering photo etching the parts I realized the cost would add way too much to the kit price.

The tail wheel and rear V-strut bracket are photo etched only because the plate was used on the 1/12 scale S-39 and fits here as well!

The .025 aluminum sheet strips are provided cut to the correct widths to make the metal brackets easy to cut out. The auto cad drawing showing the metal parts are also included in the kit. Cut them out and use a glue stick to attach them to the metal strips.

Use a small pair of metal cutters to cut out the brackets. More detailed parts can be cut out with a jewelers saw backed up on thin plywood sheet.

The laser cut brackets on the 1/16 ply wood sheet solves the more complicated shapes at a reasonable cost and has the required strength to support the struts.

The S-1 wing strut cross bracing requires a 1/16x 3/16 ply insert and then balsa build up to form the airfoil shape. Sand the shape into those parts.

The 5/16 airfoil tubes will have to be cut to inset the S-1 brackets. Set with epoxy glue.

Use the 1/4 aluminum airfoil tube for the two vertical struts. Use the .038 wire for the horizontal and the X bracing to complete the struts.

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Sport scale modelers will not use the cross bracing struts.
This is really for the scale builder and not the sport scale modeler.

Landing Gear

The landing gear is an option and does not come with the kit.

The parts that make up the landing gear are on the material list. The laser cut hubs and wheels can be purchased separately.

The wire wheel and the replica wheel hubs are laser cut to fit the inside of the 3-in foam wheels. Back the hubs up with thin black paper to block out the wheel center structure.

The hubs are not structural and are for appearance only. This gives a scale appearance with out the added cost of wire wheels.

Block the hull up using the foam structure shown in photos 41 and 42. This will keep the foam wheels from getting a flat spot on the bottom of the tire.

Speaking of wire wheels, no 3-in. wire wheels could be found. Any suggestions welcome on locating 3-in. wire wheels?

Building the fuselage

See photos 1, 2, 3, 4, 5, & 6

Remove the crutch K-1, keel C-1, keel lower sides K-2-S, from the 3/16 balsa sheet.

Build the keel first, glue the K-2-S to the front bottom sides right and left.

Add the 3/16 short part #1 to the front right and left.

Glue the 1/4 x 3/16 strip to bottom rear side to aid in attaching the split lower hull parts.

The keel is reinforced with scrap 1/8 sq at rear vertical and at the front vertical in front of former 8. Glue two short pieces 1/4x3/16 strips at the very rear of the keel. Glue in a 1/16 x1/4 bass strip to load the two tail wheel screws

Add 1/8x1/4 balsa strips to the top of the keel to support the floor fixture.

The 3/16 balsa floor fixture is used to center the two hull half's when installing them. It will be removed once the lower hull parts are glued in place.

Glue the two 3/16 crutch parts together just ahead of the former 8 location

Now you can glue the crutch to the keel using the front and rear slots as guides.

If you are building the interior, use the full former 8 painting medium grey. See photo 4.

The open formers 8 and 10 are used for the sport model with no interior parts.

Former 11 ends at the floor line and uses mahogany parts, **special order**, exterior glued to the front and back.

Add the landing gear plates G-1 and the 1/8x1/2x 3/4 bass wood blocks in the inside corners of former 8 and 10, 4 blocks total.

Slightly bevel the front and bottom strips to allow the curvature of the hull to fit.

Water seal the wood structure with clear dope or what ever you prefer to use here.
It is time to add the two vacuum form hull parts.

Pin the floor hull fixture to the balsa strips glue to the top of the keel inside the frame.

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Make sure the fixture is level. This fixture makes positioning the hull parts accurate.

The left hull bottom has the trim line scribed into the parts

Trim the left hull on the scribed line noticing, that as the trim line moves forward it becomes closer to the outside edge. The curve towards the front is moving in two directions. Don't let that deceive you, please follow the line on the parts.

Once the left side is installed, set the right side in position and mark at the bottom to left side cut line at the keel and draw a trim line on the right side

This will give the most accurate cut line and the best fit. The fit here is not critical as the seam is filled in with filler to seal.

A plastic strip 020x3/16 goes over the seam from the front to the rear.

When the parts are dry a leak test must be performed to check for leaks. Using CA on the inside along the keel bottom usually takes care of any leak found.

Once you are satisfied there are no leaks you can install the interior after removing the floor fixture.

If you are not using the interior parts proceed to finish the hull by adding 1/8 light ply pads KSP at the rear.

Add the 1-in. aluminum angle that supports the lower wing. Make sure the 1-degree dihedral is bent in the part. See the front view on the plans.

Continue by adding the 1/4 balsa strips C-2, C-3 to the top of the crutch.

You can trim and fit the clear top vacuum form parts starting with the front top. The clear parts make it easy to draw a line at the bottom of C-2 with magic marker.

Do the same for the rear cabin top.

Trim the canopy to fit.

The #0x3/16 black Phillips screws are used here. The parts should all be removable to maintain the hull.

Add the metal strut bracket to the fuselage after wet sanding with 400 wet & dry paper.

Once the brackets are installed the hull can be primed.

Any surface defects should be filled with surface automotive putty and re- prime for top coats.

If you bought the landing gear install the 8-32 stubs as marked on the vacuum formed hull sides. Tap the hole for the 8-32 studs and secure with epoxy once you have the right height of the stubs.

Add the rear tail wheel frame after painting it.

For any additional surface details, please refer to the reduced scale drawings of the S-38 model.

Building the engine nacelles

See photos 33 & 34.

The nacelles can be built in your hands.

The NK center part is tabbed on the sides and slides into the side parts NS slots.

Then add N-1, N-2 and N-3 top and bottom.

Glue N-1A to the rear bottom of former N-2.

Add the metal N-5 parts in the slots of NK. Add the NCB parts to the outside of NS parts at the rear. Use the #1x3/8 wood screws to attach the metal brackets.

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Mount N-7 N7-8-B 1/16 ply wood parts to the center and N-8 using the #1 wood screws to attach to the location holes on NS sides. Pay attention to the forward mounting tabs on N-7 and the rear tabs on N-8.

The strut ends are bent to achieve the correct mounting angle.

Add the rear N-6 metal bracket on the nacelle center line.

Set aside!

Elevator, Stabilizer, Rudders

The Elevator, Stab, and Rudders can be built either from laser cut 3/16 sheet stock, or built up with full rib detail. Choose your option and use the appropriate instructions.

Elevator, Stab Laser Cut

See photos 25 & 26

The parts are on 3/16 sheet stock

Start out with the elevator, removing the openings with an X-acto #11 blade

Do the same on the stab.

Slot the stab and elevator on 3/32 centers for the CA hinges. Locate hinges as shown on the plans.

Sand the stab leading and trailing edges round.

Join the stab and elevator to check lineament and set aside.

Elevator Built up

See photos 21, 22, 23, & 24

Start out with the elevator removing the openings with an exacto#11 blade.

We are using mostly white aliphatic glue.

First taper the 1/4 sq. stinger stock to match the height of the front elevators rib to 3/16 at rear.

This will save over sanding once glued to the ribs.

You don't need to build the parts over the plans, just refer to the section drawing.

There are 27 ribs top and bottom each.

Lay wax paper and then the 1/6 balsa center crutch down flat. Glue the 1/4 leading down first and pin down over the center crutch.

Center all the ribs between the rib slot openings.

Let dry overnight and repeat the process for the other side. After dry remove and sand the leading edge round.

Add the hinge pads over the hinge slots 1/8x1/4x1/2 balsa. Drill the hinge hole opening to match the Robart hinge diameter, making a tight fit

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Stabilizer Built Up:

Again, remove the opens and lay down the center 1/16 balsa crutch on wax paper.

First glue the 3/32x1/4 balsa strip down at the rear of the stab crutch.

Next start gluing the front ribs down making sure that meet the rear 3/32x1/4 balsa strip. This will line up the ribs to the front leading edge.

Then add the 1/8x1/4 balsa leading edge, extend to the tip leading edge glue and pin. Then add the 1/16x1/8 balsa strip to the rear top. We used thick CA here.

Add the 1/8x1/4x1/2 balsa strips centering over the hinge slots top and bottom.

Add the tip horizontal 18/1/4 balsa strip to keep the tip from warping. Add the two tip top front balsa parts to complete the first step.

Let dry over night. Repeat the steps to finish the other side, Once both sides are complete add the 1/32 curved strip to the rear of the stab. This will give a nice finish to the rear.

Drill the hinge holes to match the Robart pin hinges, making sure you have a tight fit.

Round the leading edge and blend in the tips. Lightly sand the top and bottom to complete.

Rudders laser cut

See photos 25, 26, 27 & 28

Remove the parts from the 3/16 balsa sheet. Remove the fins from the 1/32 ply and the 3/32 balsa sheets.

Notice that the CA hinge slots are cut into the 1/32 ply sheet cores. If you choose to sand in the concave and the convex shapes into the fins, the ply core will give you a centerline to sand to.

If you choose not to do that, simply round out the leading and trailing edges.

Add the 3/16 dowel to join the top and bottom fins.

Rudders built up

See photos 29 & 30

The rudder and fin are built using the 1/32 balsa crutch with 1/32 ply centers to locate the ribs.

The leading edges are 1/8 sq balsa along with the rudder rear. Glue them first to the crutch. Then add ribs 1 thru 5 using thin CA to glue.

The tops and bottoms are laser cut 1/8 sheet parts that match the curves. Sand to shape.

It was found that it was much easier to use 1/16x18 balsa strips for the fin ribs than the laser cut parts. It is much easier to handle the 1/16x18 strips than the ribs. Once they are installed you can sand the convex shapes using a i-in round sand tool.

Taper the opposite side to a airfoil shape. A little care is required so take your time here.

Add 1/16 x 3/16 balsa strips over the hinge opening ,both sides. These are not shown on the plans. This will enable you to secure the Robart hinges. Do the same to the fins to secure the hinges.

A 1/16 wire joiner is used to join the two fins together and solder a horn in the center for the control rod to attach to.

If you are using a scale control system use the rudders horns as shown on the metal sheet. These are made from .025 aluminum sheet and attached with the #0x1/4 Philips screws.

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Top Wing center section

See photos 7 & 8

Cut 1/16x4x36 in half into 2-in strips.

Build the center section first.

Lay down the 1/16 sheeting pinning to the plan matching the rear edge to the spar rear edge.

Pin down the 3/16 sq bass wood spar again matching the rear edge. Then glue with thin CA along the rear edge. This will locate the correct front spar depth to the rib spare notch.

Cut 1/2-in. trailing edge strips from the 1/16x2x24 bass wood sheet. Pin down to the plan.

Once the front spar, 1/16 sheeting and the trailing edge are down, you can start gluing the ribs in place.

Start with the route ribs, W1P at both ends gluing down first.

Decide on using your computer radio to set up the two rudder servos as shown on the plans. This will be necessary to set up the two servos eliminating a Y harness.

If you are using a Y harness you must rotate one servo so they are parallel moving in the same direction.

Move W-1-S so the servo horn is inside the boom to drive the rudder control rod as shown on the plans.

Add the sub 3/16 bass spars that support the bottom brackets. This gives the need support to the spars and material to mount the brackets.

Then glue the remaining ribs in place working towards the center from both route ribs.

Once the ribs are in place add the rear top 1/8 Sq spar and the two 1/8x1/4 top rails that support the top vacuum form parts.

Add the 1/4 sq balsa leading edge.

Lift the wing off the plan and add the rear 1/8 sq bass spar and sub spares that support the brackets.

Wet the front 1/16 sheeting to ease bending and glue to the bottom ribs and the bottom front 1/4 balsa leading edge.

Slot the bottom 1/16 sheeting at the spare front to side in the W-1 & W-2 1/16 ply brackets.

Add the 1/16 W-1 and W-2 to the front spar and glue leaving 1/4-in. depth at the bottom to clear the mounting struts.

Add the 1/4 sq bass wood joiner, **Note: do not glue the joiner to the ribs.**

Once all the brackets are mounded to the wing center section you can glue the top 1/16 sheeting ending at the 3/16 spare at the rear.

The brackets are added later once the wings are joined.

Add the wing tip blocks to the front matching the height of the 1/16 balsa front sheeting

The wing center section is now ready for cap striping.

Cap Stripping

Cut the 1/32x4x36 sheeting into several 7-in lengths.

Then cut. Cap strips into approx 1/8 widths. This does go quite fast.

The bottom wing will require shorter 1/32 widths along with the center section at the top rear off the vacuum form opening.

The tongue box is built around the tongue tab installed in the out panels built first.

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Outer Wing Panels

See photos 13, 14, 15, 16, 17, & 18

Please notice that the alumn. wing joiner was used in the photos shown. This is now changed to using the 1/4 sq bass wood instead as stated in the introduction. The building method is the same.

The outer panel is built along side the center section once the opposite side is blocked up at one degree setting the dihedral angle. This will allow the outer wing panels to be built flat on the building board. This will also give a accurate alignment to the wing center section.

Use the same method as the center section except as follows.

Pin down a 1/16x1/2 bass wood strip on the front bottom aileron edge and cover with wax paper. This will align the aileron ribs to the right height with out gluing to the bottom sheeting. The bottom sheeting will be added later.

After the 1/16 balsa sheeting is laid down and the front 3/16 balsa spare is glued to it at the rear, pin down the 1/16 x 1/2 bass wood trailing edge.

Clamp the route rib W-2-P to the route rib W-1-P at the center section. This will set the correct dihedral angle at the W-2-P route ribs.

The 1/4 sq wing joiners is extended five ribs over from the route rib.

Add the W-2 ribs and one each of the TR sub ribs over the 1/4 sq wing joiner as you progress toward the wing tip. **Again do not glue the 1/4sq to the W-2 ribs.**

The wing joiner is made removable.

See photos 19 & 20

Once the W-2 and the TR sub ribs are in place start with the W-1 rib at the aileron pocket.

Glue down the two W-1 rib that form the aileron pocket.

Then cut and fit the 1/18x1/2 balsa strip and glue in-board matching at the top of the ribs.

Then you can add the W-3 ribs and then the remaining W-2 ribs.

Add the tip 1/16 ply part on top of the front bottom spare and glue at the rear to the bottom of W-1.

Once the 1/4 sq leading edge is in place, you can glue the ply tip centering to the leading edge.

Now add the tip ribs 4 thru 7 and glue in place. After all the ribs are in place glue the 1/14 sq leading edge in place.

Glue the front wing tip parts to match the sheeting height top and bottom, see the plans.

Glue the top 3/16 balsa spare and the rear top 1/8 sq spare in place.

Add the rear 1/16x1/2 trailing edge and pin down to the plan.

Cut and fit the aileron leading edge and tip to the correct angle using an aileron rib to set the angle. It is best to set both ends together using two ribs checking that parts are straight.

The end aileron ribs are doubled giving a 1/8 thickness here. This will keep the ends from warping and will give a much better fit to the wing sides.

Add the remaining aileron ribs.

Add the horn plates as shown on the plans.

Remove from the building board and add the bottom rear 1/8 sq balsa spare.

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Add the 1/16x1/2 bass bottom to the aileron over the 1/8 x 1/2 balsa aileron leading edge. The bottom 1/16 sheet is flush with the front of the aileron leading edge. This makes a very strong aileron part.

Add the top 1/16x3/8 bass wood strip again lining up to the front edge of the 1/8x1/2 balsa aileron leading edge.

Now you can cap strip the aileron with the 1/8x1/32 balsa cut from the sheet stock.

Build the aileron servo parts S-T and glue in the 1/4 sq bass servo support blocks.

Adjust the height before hand to accommodate your servos before gluing SB-A to the W-3-P ribs as shown on the plans.

Then glue the 1/32x 3/16 ply strip to the bottom of the W-3-P ribs to support the covering material.

Mount your servo and test fit to the opening.

Slot the 1/16 bottom sheeting where the W-2 1/16 ply strut brackets are located.

Add the W-1 and W-2 1/16 ply bracket to the wing front spar and glue to the front of the spares.

Add the top 1/16 balsa sheeting over the top spar and over the top of the leading edge.

Wet the sheeting before bending after the rear of the sheet is glued to the rear top spar.

Shear plate the front spar by cutting the 1/32 sheet into the right height and width up to W-4.

Now you can cap strip the wing top and bottom with the 1/8x1/32 strips.

Again, remove and cap strip the bottom.

Add the tongue parts as shown on the plans

Build the opposite outer wing panel using the same method

Once the wings have been joined to the center section the metal and wood strut brackets can be add as shown on the plans.

Use #1x3/8 brass flat head wood screws to attach the metal bracket to the wing center section on the bottom.

Glue in the 1/16 wood brackets as shown on the plans

The 080x3/8 hex head bolts are use to attach the strut ends to the brackets. All the bolt ends should be pointed on a grinder. This will aid in alimnet when attaching to the brackets taped for the 080 bolts.

Once all the struts are in place medium CA is used in place of nuts to secure the bolts to the brackets.

You can apply heat from a soldering gun to loosen the 080 bolts if necessary.

The exception here is the two rear V-struts that attach the booms to the rear of the fuselage. Two 080 nuts were used here. These two struts are adjustable using the 1-64 clevises. This is necessary for fine tuning the alignment at the tail!

The two center nacelle struts use the 3/32 brass tubes with the 1-64 clevises.

The rest of the strut ends are made from the 1/4 aluminum tube with one end flattened. File the end round and drill with the 080 clearance drill. Two sample strut ends are provided in the kit for your review.

Building the booms

See photos 21 & 22

Remove the 1/8 light ply centers and the openings with a # 11 X-acto blade.

The slotted 1/16 ply parts are inboard mounted to the boom center core. The rudder push rods go between the boom centers and the covering. Mount them as shown on the plans.

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Then glue the outside 1/16 ply parts as shown on the plans.

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Then glue the 1/16x1/8 bass wood strips to the top and bottom sides.

This stiffens the boom but keeps the structure light. Add the metal parts as shown on the plans that connect the airfoil tube that join the booms together.

Sand lightly and set aside.

Build the Floats

See photos 34 & 35

Remove the 3/16 balsa crutch, formers, and the 1/16 balsa keel from the sheets. Notice the crutch is slotted for the keel to fit into.

Before gluing the parts together use the top

Glue the parts together after the 1/16 ply pads are glued into the four notches that hold them in place. The ply parts are glued together to form the right thickness.

You may have to sand the opening slightly so the pad fit in the openings.

Once the pads are mounted use the crutch as a template to locate the 1/8 holes in the 1/32 ply plates in the bottom of the lower wing. Once the 1/8 holes are drilled in wing you can assemble the float parts.

Add the top 1/8 balsa top vacuum form part mounting rails as shown on the plans. These parts are laser cut. Remove from the 1/8 balsa sheet.

Once the parts are assembled, clear coat with sealer to water proof.

Now you can add the clear vacuum form top and bottom.

Trim the top first after setting on the top formers and make at the top of the 3/16 crutch.

Once trimmed, glue the vacuum form top in place.

Now turn the parts over and drill the 1/8 strut holes using the crutch a guide to locate the holes.

Then locate the bottom clear vacuum form parts marking the trim line at the top of the crutch. This will give you a perfect fit to the two parts.

Check for water leaks here before painting.

The clear vi-vac makes locating the parts easier than the white styrene and makes check for leaks possible.

Set aside the finished parts.

Lower wing assembly

See photos 9, 10, 11, & 12.

Lay down the front bottom 1/8 sq bass spar. Cut the two 1/32x1/2 bass wood trailing edge from the 1/32 x 2 sheet stock.

Lay down the rear 1/32 x1/2 bass wood trailing edge.

Tilt, the 1/8 light ply route rib, one degree and glue..

Add the remaining ribs moving towards the wing tip.

The wing tip is centered at the wing leading edge and glued at the rear to the last rib.

Add the top 1/8 sq bass spar and sheer web with 1/32 balsa sheet stock.

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Add the 1/16x1/8 strips to the rear trailing edge making flush with front trailing edge. This really stiffens the trailing edge to help make a warp free wing.

Add the wing strut attachment brackets to the front and rear front spar. Note: these are now 1/16 ply wood parts and not metal.

Tap the holes for the 080 hex head bolts.

The tongue parts are added when the lower wing can be slid on the aluminum fuselage bracket that supports the lower wing.

Use Vaseline on aluminum to keep glue from setting at these parts.

Add the bottom 1/32 sheeting and then the top sheeting . Wet the surface to ease bending.

Then cap strip the wing as shown in photo 11 & 12.

Set the lower wings aside for final assembly.

Building the Mast

See photos 36 & 37

The mast is a new vacuum form parts that makes the assembly very easy from the first method.

Separate the laser cut parts M-1 1/8 sheet , M-2 M-3 1/4 sheet and set aside.

Trim the vacuum form parts out, right and left at the base line from the sheet.

Sand in until both parts are equal in width. Use the 3/8 plastic tube to check centers.

Once you are satisfied glue the wood parts M-2 M-3 to the top and bottom as shown in the photos.

Also add 1/16x1/8 balsa strips to the side of one part to create a joint seam that holds the two parts together.

Cut and fit the 3/8 plastic tube and glue to one side. The tube assures that both sides are symmetrical.

When satisfied, glue the two half's together

The mast sets the height between the top wing and the fuselage when final assembly takes place.

Use the front and side view of the reduced plans for the correct cross wire locations and locate the mast on the fuselage .

These detail sheets are reduced down from the original plans. They are most useful here!

Final Assembly

See photos 43 &44.

It is best to cover the parts and paint them before installing them permanently.

A pre assembly is important to run and check the control surfaces but don't glue both hinged surfaces at this point.

The booms and tail group can now be attached to the wing center section.

Note: in the photos the parts are blocked up to clear the strut brackets.

Please use level, straight, 3/4 blocks for this part of the assembly.

Measure twice and it is best to have a friend assist you here. The booms and stab are set at 0 degrees to the bottom of the wing. The block used sets the angle up automatically so no measuring is necessary here.

The wing boom slots and the stab boom slots set the correct distance between the booms.

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Check the measurements here and make sure the booms are vertical before gluing to the wing and stab.

The elevator is removable so the rudders can be added later once the wing is on the fixture used to attach the wing to the fuselage.

Once the parts are joined to the wing center section, booms, stab, the assembly can be moved to the fixture.

See photos 45, 46, 47, 48, 49, 50, 51, 52, 53, & 54

Turn the wing over to mount the engine nacelles in place.

This is the most difficult part of the assembly.

The 3/16 balsa fixture is used here to accurately attach the nacelle to the wing.

Glue two 1/8x1/4 bass wood strips to the fixture side that would attach to rib W-1-S on center using wood screws

Add 1/8 x1/4 bass wood strip to the sides of the fixture and glue them there.

Then use screws to attach the fixture to the nacelle, part # N-2 at the front centering.

Now you can attach the fixture with the nacelle in place to the wing bottom.

Make sure it is vertical and on the boom center-line and parallel to the wing ribs.

Use scrap 1/16x3/16 balsa once the nacelle is in place to measure each strut length starting at the front side and mark the hole center-line.

The struts are 5/15 aluminum airfoil tubes with 1/4 aluminum tube strut ends.

Using the 3/16 wood strips as a guide. Slide in the 1/4x1 strut ends into the 5/16 tube to obtain the proper length. Some fine tune adjustment is possible here to ease the set up!

Once the correct length is found remove the 1/4x1 Strut ends and drill a 1/16 hole 1/8 from the ends.

Once all the struts are attached to the nacelles you can use a hand drill to extend the hole through the strut ends. Use a tooth pick as a pin to secure the strut end and glue with CA.

The two center nacelle struts are 3/32 brass tube tapped for the 1/64 clevises and flattened at the other end. Drill a clearance hole for a 080x3/8 hex head bolt at the flattened end.

The 1-64 clevises will give some adjustment to the nacelle center-line.

The rear nacelle strut sets the incidence to the wing 2.5 degrees. This is the same as the wing giving some up thrust to the motors.

Once the nacelles are installed you can build the fixture and assemble the wing center section to the fuselage.

See photos 39, 40, 41, & 42

The fixture is made up from 1x2 pine, using two up rights and one horizontal strip that is used to set the 2-.5 degree angle. This will set the proper wing incidence to the fuselage.

The height of the fixture is not critical but the 2-.5 degrees is. Make sure it is right.

Again, having a friend help you here is important.

I used a foam platform to set the fuselage level, see photo 39. Then I raised the fuselage up to the wing center section bottom. The mast is temporarily used to establish the correct distance between the two assemblies.

Used a short level to monitor the assembly checking constantly as I added the struts.

Again, use 1/16x3/16 balsa strips to determine the strut length.

The front strut that goes between the engine nacelle center is 1/2 airfoil tubing.

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The wiring from the motors will be installed down the strut and into the fuselage between the vacuum form hull and the finished side walls.

It is necessary to slot the inside top facing the nacelle side 1-in. from the top of the strut.

Make a 1/4 wide slot there to accept the three wires.

Do the same 1/2-in. from the bottom of the 1/2 strut facing the fuselage side.

The wires go behind the canopy.

The horizontal strut that goes between the engine nacelles inboard is 1/2-in. airfoil aluminum tubing.

A 4/40 all threaded rod is used to connect the nacelles and goes through the mast center as show on the plans.

A long 1/16 drill 12-in., is used to locate the base holes for the 4/40 rod before the vacuum form parts are installed to finish the nacelles.

The rod stiffens the assembly together and is functional. Two nuts secure the rod at the inboard NS parts, Use CA to secure the rod at the mast sides.

The 1/2-in airfoil tube can be installed cut to length. Check length to the vacuum form clear bottom inboard side for exact location.

Make sure the 4/40 nuts are tight before adding the vacuum form bottom part.

Add the two rear V-struts adjusting until the stab is level.

Add the .038 wire cross bracing though the mast.

Use the 1/16 tube inside the 3/32 tube to locate the .038 wire to the bottom of the wing and at the fuselage in the cockpit side wall right and left.. See sample provided.

Vacuum form parts

Add 1/4x1/2 bass mounting blocks to the rear of the nacelle parts, both sides, N-1 N-2 and N-3 at the center to attach the vacuum form parts to. These are not shown on the plans.

Sample vacuum form parts are included with the slots marked with a magic marker to be used as a template to cut the finished parts. Make all your adjustments here and then transfer the slots to the finished parts.

Note: the vacuum formed nacelle parts come as two separate parts for each nacelle.

The nacelle parts are trimmed as follows.

1- rear cone part top and bottom, install first leaving more material at the front so the center part will over lap.

1-center top part cut from the full nacelle part at the rear line. Extend the front so the front part will extend over the center.

1- front top part cut at N-2 front and it over laps the center top part.

1-bottom part full length cut at the at the N-3 part and over laps the rear cone.

Cutting the top into three sections makes it possible to install the parts around the struts .

The top wing center section vacuum form parts is now replaced without the ribs vacuum formed in the part.

It is better to add the T- beam 1/8 section gluing to the top of the vacuum form parts at the proper length.

The T- beams can be used on the bottom gluing the fabric covering there.

Use the reduced plans for these locations and details.

The window garages are cut out and glued to the fuselage side as shown on the detailed drawings.

Classic Aero's 1/12 Scale Sikorsky S-38 Construction

See Williams Bros instruction for building there 1/12 scale 9 cylinder motors.

The cylinders are attached to our hubs supplied in the kit.

Cut the openings as marked on the cowls supplied to fit around the 9 cylinders

The exhaust rings are assembled using a black inner ring cut in half to fit inside the two outer rings top and bottom. This acts as a tab giving gluing surface to bring the two outside parts together.

The two extension tubes are supplied. They are the two 3/8 plastic tubes.

Finishing the model.

This part is up to you.

To paint the plastic parts use only enamel, water base paints, or urethane. Do not use lacquer base paints as they will attack the plastic.

The bottom wing center section is the most difficult to cover because of all the brackets. I use Super Coverite or Solartex because you can see through them to cut around the brackets.

Happy flying!

Flying the model will be posted on the web site along with new photos

Classic Aero's 1/12 Scale Sikorsky S-38 Construction

Kit Material List

Strip Wood

Wing Top

2-1/4 sq.x36	leading edge balsa wood
1-1/4 sqx24	wing joiner
4-3/16 sq.x36	front spars bass wood
4-1/8 sq.x36	rear spars
2-1/8 sqx36	rear spars center section top wing
2-1/32 x1/2x36	rear trailing edge ply.

Lower wing

1-1/8 sq.x36	leading edge balsa
2- 1/8 sq.x36	front & rear spars bass.
1-1/32x1/4x36	rear trailing edge balsa
1-1/16x1/8x36	rear lower spare bass

Stabilizer

Laser cut

Built up

1-1/32x1/2x19
2-1/8x1/4x36
2-3/32x1/4x36
2-1/16x1/8x36
2-1/8x1/4 sqx36

Laser cut or built up

3/16 sheet

Special order

rear curved back shaped balsa
leading edge balsa
rear top & bottom crutch balsa
top bottom rear balsa on rear of ribs
elevator leading edge balsa

Elevators

Laser cut

1-1/4 sq.x36

3/16 sheet

leading edge sand bevel to match rib height before gluing to crutch

Rudders

Laser cut

Rudders

Built up

2-1/8x3/32x36
2-1/32x5/32x36
1-1/8 sqx36

Laser cut or built up

Fin 3/16 sheet

1/32 ply core and 3/32 sides

Special orders

leading edge balsa
top bottom plates cut from 1/32x4 sheet
fin leading edge

Classic Aero's 1/12 Scale Sikorsky S-38 Construction

Booms

8-1/16x3/16x36
4-1/16x3/8x36

center 1/8 light ply laser cut

boom sides
boom top & bottom

Sheet wood

1-1/32x4x36
1-1/32x4x36
1-1/16x4x36

wings cap strip cut into 1/8 strips
lower wing leading edge sheeting cut to it
wing leading edge sheeting cut to fit

Plastic Trim

2-UFS-6 3/16
10-#243
1-#294
1-#136-.125
1-#133-.060
1-#236x3/8x2"
1- .010 6x8 aprox
1-.015 6x8 aprox
3- #TFS-4

U- channel top hatch rails
half round trim fues, & floats
1/8 angle door sill window garage
hatch tops
hatch bottoms
tubing mast center tube revised now vacuum formed
fuse. bracket mounting plate use metal drawing for pattern.
hatch cover sliding front top.
T section top hatch support

Metal package

1-1/2 alumn tube
1-package 1/8 alumn tube
5-5/16 K&S tubing
2-1/4 K&S tubing
1- .025 alumn.
1- .025 alumn
1-#100SCF&21
2-.025x1-in alum.
2 3/32x 9 brass tubing
4 3/32x 1-3/4 brass tube
6-1/64 clevises brass
56- 080 x1/4 bolts
12-#0 x3/16 screws
2-80 hex nuts 1/8x.047
1/16x1/2 alumn. Tube

mast center strut and front fues top strut .
front and rear float struts
airfoil wing strut tubing
rear top bracing and rear V-strut
tail wheel frame sport scale
rear V-strut bracket mount in front of the tail wheel frame
door handle set front hatch & cabin interior door
L-brackets lower wing mounting
rear V-struts tap for 1/64 clevis
nacelle center struts tap for 1/64 clevis
adjustable strut ends, nacelle center, rear V strut
#HBB0004 Strut attachment ends
#SMFP0003B Attach plastic parts
#HNSS0080 secure rear strut ends
glue to cross bracing ends

Classic Aero's 1/12 Scale Sikorsky S-38 Construction

3/32x1/2 alumn. tube	flatten one end and bend, glue other end after inserting the 1/16 x1/2 tube. SEE SAMPLE!
1-1/8x18 alumn tube	Cut to the right length
3 .032 wirer	#501- mast cross wire bracing & rudder push rods
Cable 6 ft.	elevator controls, cross bracing cable cross bracing
4-2/56 rigging couplers	boom cable guides cross bracing trim to fit
1-1/4x12 x025	metal brackets <i>cut to make the parts</i>
1-5/16x12x025	metal brackets
1-1/2x12x025	metal brackets
1- 4/40x12 threaded rod	mast support to nacelles
2-4/40 locking nuts	nacelle inboard NS side for all thread

Vacuum form parts

1-bottom hull right	V-1R 060 plastic black
1- bottom hull left	V-1-L060 plastic black
1- front top	V-2 030 vivac clear
1- canopy	V-3 030 vivac clear
1- rear top	V-4 030 vivac clear
4- nacelle top 7 bottom	V-5 030 vivac clear
1- nacelle top	V-5 030 vivac clear use for template cut to fit
2- nacelle rear	V-6 030 vivac trim to fit
1- mast right & left	V-7 030 white trim to fit
2-engine cowl	V-8 030 white trim openings
4- exhaust rings	V-9 030 white or black outer parts
2- exhaust rings	V-9 030 black split for inside tabs
2- engine hubs	V-10 030 white or black mount cylinders
2- top wing hatch covers	V-11 030 white right & left add ribs
2- float bottoms	V-12 030 vivac clear check for leaks
2- float tops	V-13 -3- vivac clear trim to fit

Misc. Parts

Sig CA hinges	light hinges, airloines, rudder , elevator
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Landing gear

EPW300 Wheels
1- KS 9/16x12 tube

Special orders only

HI TEC foam wheels 3-in., flying only
outer upper landing gear leg cut to fit

Classic Aero's 1/12 Scale Sikorsky S-38 Construction

1-KS 1/4x12 tube	inter upper leg cut to fit
1- 3/26 spring	inter spring 5 pounds load
3/16x6 alum tube	lower gear leg tap bottom end for 6/32 bolt
2-6/32 studs	screw into lower alum leg end
4-8/32 studs	gear attachment at fuselage install
1-1/16 steel wire	inter landing gear lower legs wheel attachment bend to fit
1-3/32 brass tube and structural reinforcement	outer gear legs cut to fit outside the 1/16 steel wire for scale appearance.
1-1/4x1 tube secure with thin CA	slot end for the 6/32 steel stub at axel end after installing the wheel and
2-080 hex head bolts	attach the lower alum leg at the 6/32 stub to the slotted end at the axel
1-3/16 x8 alum tube	retract strut replacement for water flying

Note: the lower leg is removable and replace with a shorter leg for water flying.

Landing gear package

Total \$55.00

Interior parts

special order only

1-sheet interior plans	1/12 scale interior detail sheet
1-set mahogany parts	010 laser cut parts
1-set 1/32 ply wood parts	laser cut , consul, foot pedals, dash, misc parts seat legs
1-sheet 015 plastic	laser cut window frames, misc. detail parts.
2 cockpit seats	V-14 030 white
2 wicker seats	V-15 white
1 sliding hatch	V-16 vivac clear
2- 3/16x14 rails	sliding hatch rails
1- sheet 1/8 light ply	wicker seat legs
1-sheet wicker paper	computer printed wicker pattern
1 package plastic	misc plastic trim details

Interior package

Total \$125.00

Paint interior- not supplied

Sikorsky grey, cockpit, side floor, Console, brake pedals. - Ace hardware # 19717 light grey **enamel only**
Balsa & ply window sills & misc. parts - Krylon primer #1317 ruby brown to match mahogany