

T&J Models

R/C Model Designs By Jim Young

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Wedell-Williams Model 44



“Hot as a .44, and twice as fast”

Introduction

Jimmy Wedell was one of the most successful racing aircraft designers of his era. With only a 9th grade education, he had a real “seat of the pants” approach to designing. The Model 44 was literally built from chalk marks on the hanger floor. Backed by lumber tycoon Harry Williams, Jimmy Wedell produced several record breaking aircraft. The Model 44 was the first land-plane to break 300mph, and Roscoe Turner set a transcontinental speed record in his Model 44. These records are on top of several wins in the Thompson and Bendix races. Jimmy’s design career and life were cut short, not by a racing accident but by a student pilot who froze at the controls.

Our Model 44 is 1/6 scale and is designed for electric powered. It features a unique wing latch mechanism and flying wire attachment scheme which does not require any tools for field assembly. The size is small enough to be affordable, yet large enough to fly in most conditions. So, if you want to have a little piece of history in your hanger, let’s get started....

Construction

The construction of this model requires some intermediate level of modeling experience. All of the major parts are laser cut, and the builder is left to select wood and hardware to complete the model.

Materials List:

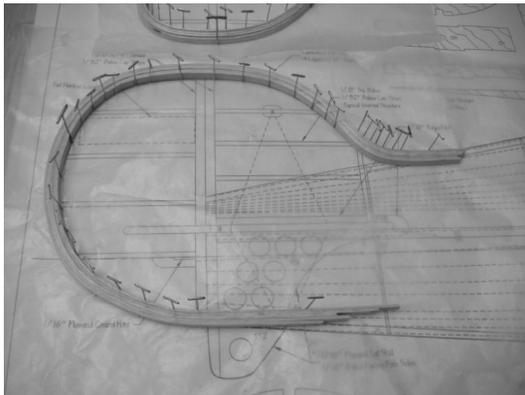
Wood:

- (8) 1/16" x 4" x 36" Balsa
- (4) 1/16" x 3" x 36" Balsa
- (1) 1/8" x 3" x 36" Balsa
- (1) 3/16" x 3" x 36" Balsa
- (1) 1/4" x 3" x 36" Balsa
- (1) 1/4" x 36" Triangle Balsa
- (4) 1/8" x 3/8" x 24" Spruce
- (2) 1/8" x 1/4" x 36" Spruce
- (1) 1/4" Sq. x 12" Spruce
- (1) 1/8" x 3/16" x 24" Spruce
- (1) 3/16" x 3/16" x 36" Spruce
- (1) 3/16" x 1/4" x 36" Spruce
- (1) 1/64" x 12" x 12" Plywood
- (8") 1/8" Spruce Dowel
- (1) 1/4" x 6" hardwood triangle stock

Hardware:

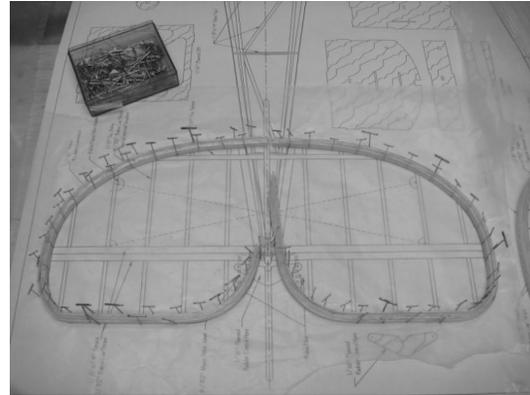
- (2) 1/8" x 36" Music Wire
- (2) 1/8" Wheel Pant Mounts
- (2) 3.5" Wheels
- (1) 2-56 x 3/4" Bolt and lock nut
- (2) 2-56 x 3/8" Bolts and blind nuts
- (1) Roll Britelace
- (6") 1/8" O.D. Brass Tube
- (12") 1/8" I.D. Brass Tube

Initial Preparation

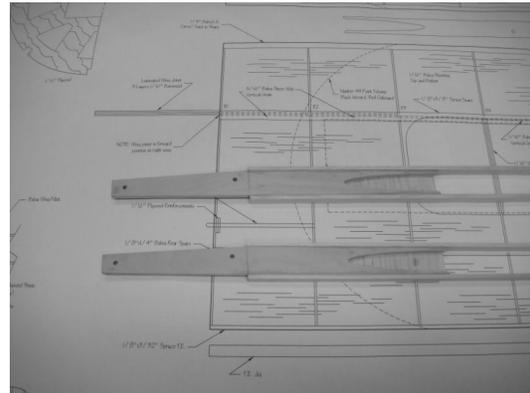


If you take care of these items up front, it will help speed along the build. Laminate the outlines for the stab, fin, and wing tips from four layers of 1/16" x 1/4" balsa. You can either

cut a cardboard template or use several pins through the plans which to form the outlines around. Thoroughly wet the strips and use aliphatic glue.



Laminate two wing joiners, each from 3 layers of 1/16" laser cut plywood. Use a slow cure epoxy here. Clear the holes of any glue with an 1/8" drill. You will make two IDENTICAL spar assemblies. Add 3/16" vertical grain balsa to each spar joiner to build it up to 3/8" thick. True up the top and bottom edges. Glue 1/8" x 3/8" x 24" spruce wing spars to the top and bottom of the spar joiners with the spar joiner flat on the board. It will look like you are making two right side spar assemblies, but this is correct.

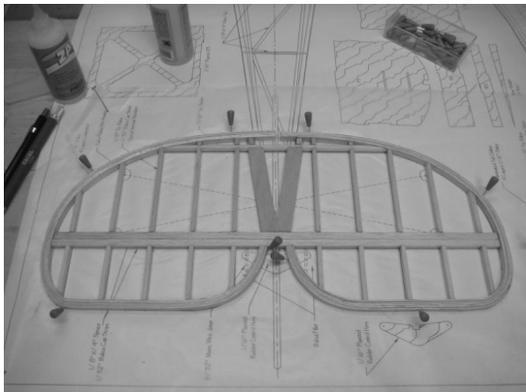


Finally, laminate the 1/16" plywood LG1 and LG2 and the 1/16" plywood firewalls with slow cure epoxy.

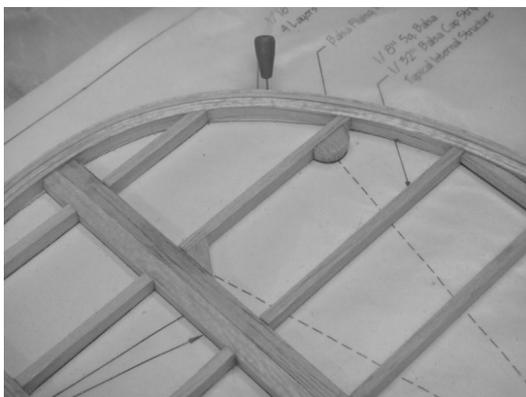
Tail Feathers

The tail feathers are built over the plans. With the laminated pieces pinned down, fill in the internal structure as specified on the plans. Cut the elevators from the stabilizer and the rudder from the fin.

Wedell-Williams Model 44



The elevator halves can either be tied together with a music wire joiner or controlled with a split control rod. The top and bottom of the stabilizer is capped with 1/32" balsa to give an airfoil shape. Bevel the leading edges of the control surfaces and temporarily install hinges.



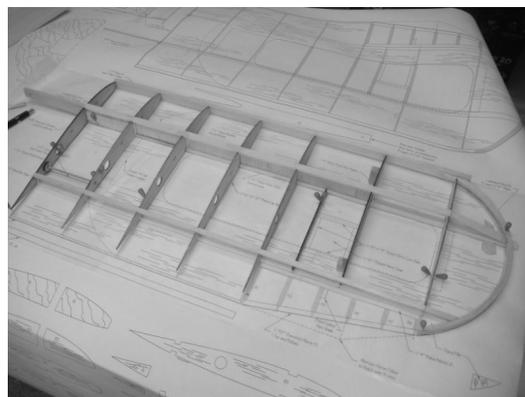
Add some scrap 3/16 balsa for flying wire mounts. We used some vinyl lacing cord (Brand name Britelace) for flying wires, and installed some 1/8" I.D. metal tubes at each mounting location.

Wings

Start the wings by gluing 1/4" balsa flying wire mounts to R7. These should be flush and square to the top and bottom of R7. Glue two plywood reinforcements to R1 around the anti-rotation dowel hole.



The wings are built up over the plans. Pin the spar assembly over the plans. R1, R2, and R3 are glued to the front and back of the spar assembly. Set the angle on R1 with the plywood dihedral gauge. Add R4 through R8. The lower spar is shimmed up to meet the ribs starting at R7.



Fit the laminated wing tip. The upper spar may need to be partially cut at R8 so it can be bent down to meet the wing tip. Trim the spars to length and glue the wing tip to R8 and the main spars. Glue the 1/8"x1/4" upper rear spar in place.

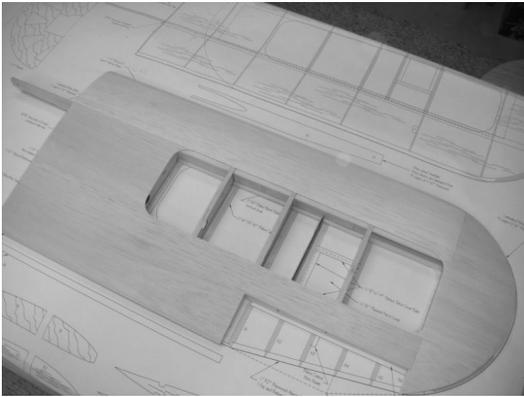
There is a plywood T.E. jig to support the T.E. of R1 through R5. Pin it in place and make sure there are no twists in the wing. Glue the 1/4" L.E. to the front of all the ribs. The L.E. should extend above and below all of the ribs.

Glue the 1/8" spruce anti-rotation dowel in place. 1/16" balsa sheer webs are added between the spars from R3 to R7.

Wedell-Williams Model 44



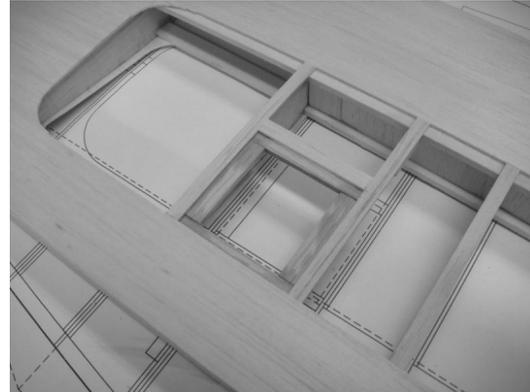
Sheet the top of the wing with 1/16" balsa. Traditional sheeting and cap strips are shown on the plans, but the Model 44 had a fully sheeted wing if you don't mind the weight penalty. For a tougher T.E. use a piece of 1/16"x1/8" basswood glued to the top sheeting.



Remove the wing from the board. Pin down the wing and use the T.E. jig. Glue the 1/8"x1/4" balsa lower rear spar in place. Use scrap balsa to fill in between the rear spars from R5 to R8.



Sheet the bottom of the wing with 1/16" balsa. The lower sheeting should be tapered at the T.E. to meet with the top sheeting.

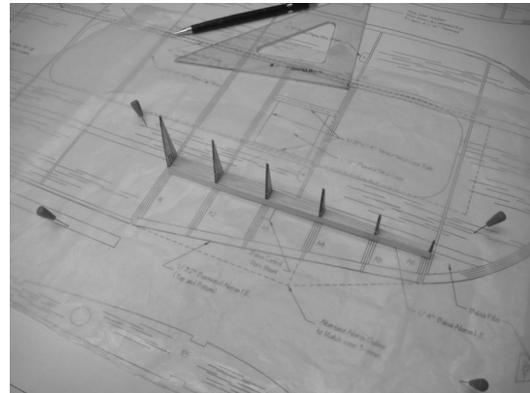


Add the 1/8"x1/4" spruce servo cover rails. The aileron servos are mounted to the 1/16" plywood covers and 4 screws hold them in place.

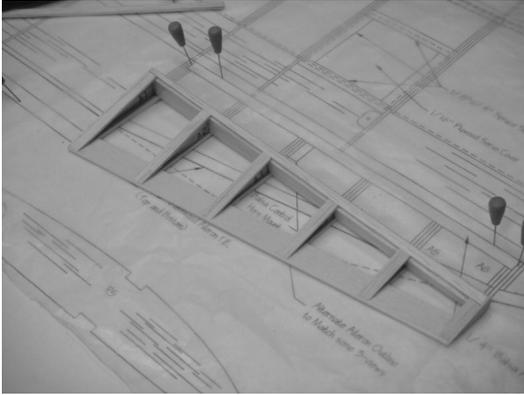
Repeat the wing construction for the other wing to this point. Note that one spar joiner will be toward the front of one wing and toward the rear on the other.

Drill holes for the flying wire mounts, and glue 1/8" I.D. brass tubes in place.

Glue the aileron ribs to the 1/4" balsa L.E. Carve and sand the L.E. to match the ribs.

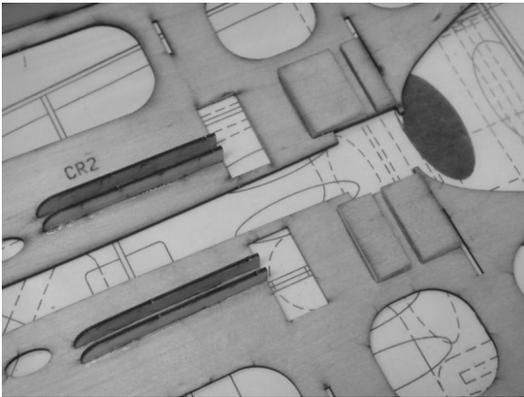


Glue the 1/16"x1/2" basswood T.E. to the ribs. Glue 1/16"x1/4" balsa cap strips to the ribs and L.E. Sand the L.E. to shape. Add a mount for your control horns and temporarily hinge them to the wings.

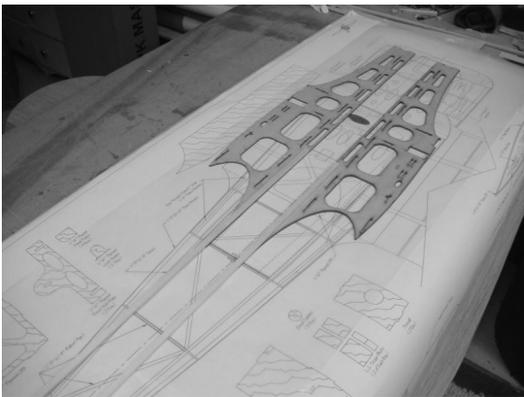


Fuselage

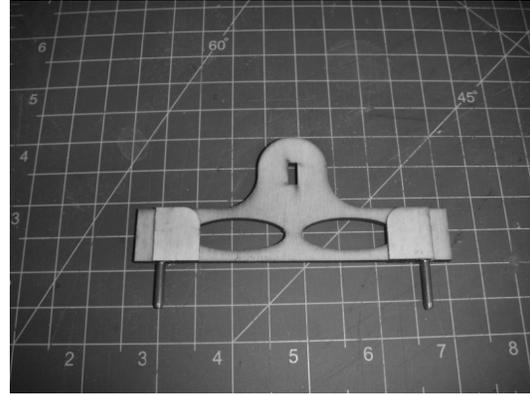
Mark the locations of all of the formers on the outsides of the CR2s. Glue the 4 carriage guides, and the 1/16" plywood torque blocks to the CR2's. There are two of each of the torque blocks that are glued together for 1/8" total thickness. Use the holes in the landing gear plate to align the torque blocks. Make a right and left side.



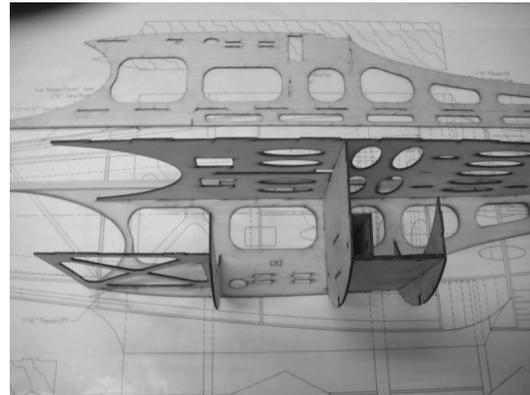
Glue 1/8"x1/4" Spruce longerons to the inside of each CR2. These are even with the top edge and end at the front of F4.



Assemble the wing retention carriage as shown. The dowel plates should be offset 1/4" from the edges. Use 1/8"x1 1/8" music wire for the pins. Taper/Round one end of the wires and deeply score the other half to help the epoxy take hold.

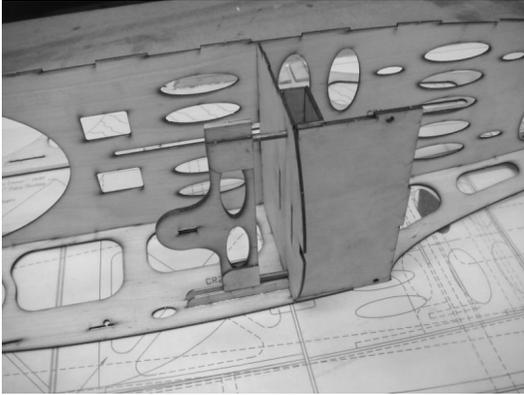


Pick one CR2, and assemble CR1, CR3, F2B, F3, F4B SB1, SB2, and LG1/2. It is a bit of a jigsaw puzzle, but they should all fit. Do not glue anything at this time.

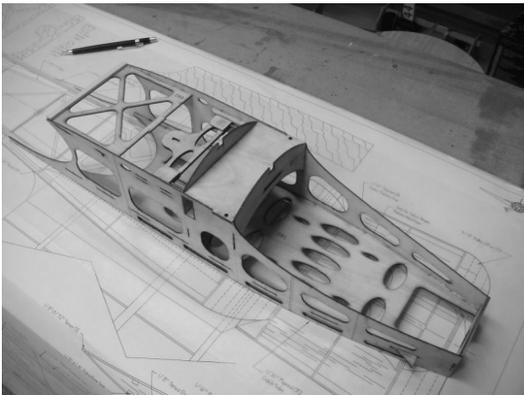


Trial fit the wing retention carriage, and make any adjustments to the holes in F3 and SB1 for easy movement.

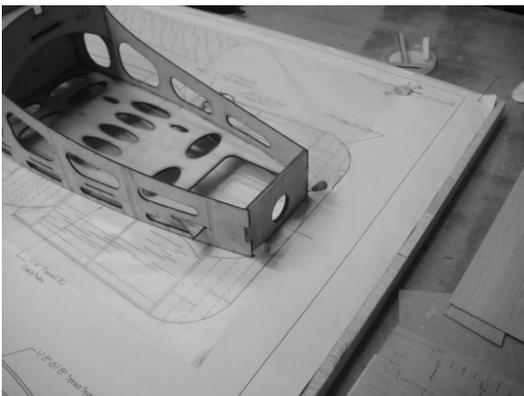
Wedell-Williams Model 44



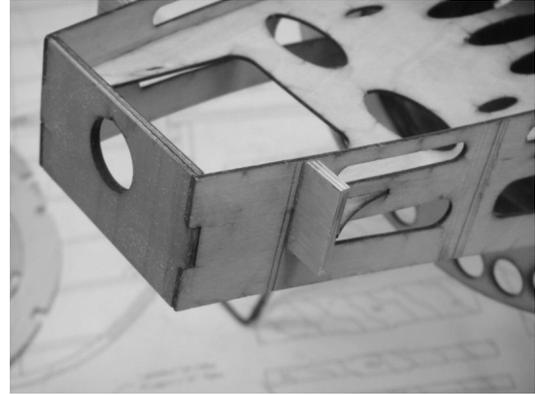
Tack glue the formers to the CR2. Assemble the other CR2 to the structure and tack glue in place. Be careful to keep glue out of the spar box. Use several wedges protected with wax paper to hold the spar box pieces tight to the holes in the CR2s.



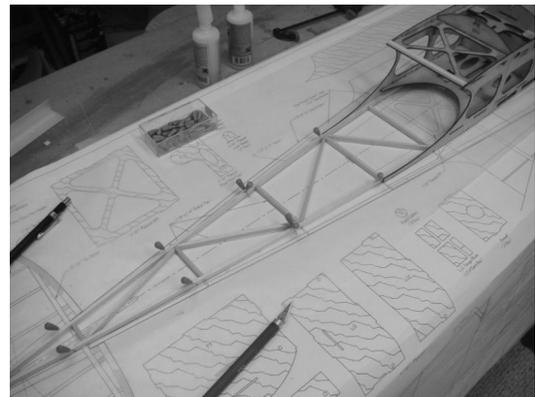
Position the crutch assembly over the plans and final glue the structure together.



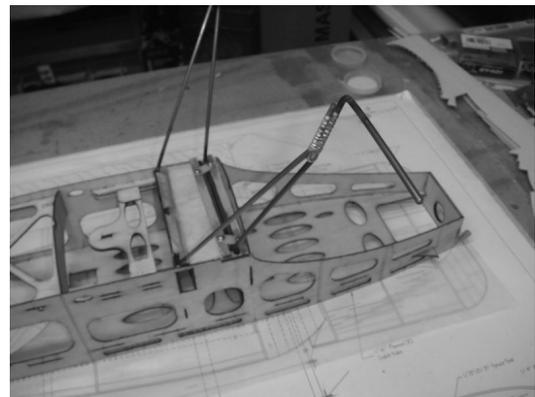
Pull the CR2's together at the front and add the laminated firewall. Reinforce the firewall with triangle stock.



The cowl mounts are glued up from two layers of laser cut 1/16" plywood. Glue the Cowl mounts to the tabs on the crutch structure.



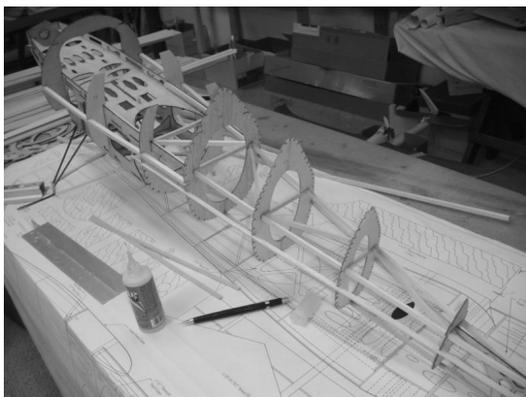
Cut the longerons to length and taper the ends so they will match the 3/16" thick fin and rudder. Glue the ends together and fill in the rear of the crutch with 1/8"x1/4" balsa as shown on the plans.



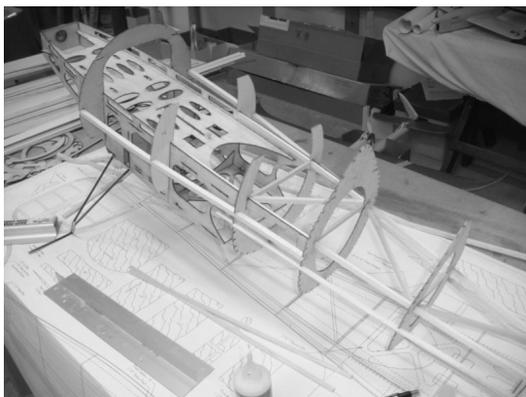
Glue 1/8"x1/4" spruce rails to the landing gear plate. Two rails box in the front L.G. wires and one rail pins the rear L.G. against

Wedell-Williams Model 44

F3. Bend the landing gear from 1/8" music wire. Use the marks on the plans to square it up. Bind the two wires with fine wire and silver solder them together. Nylon straps and screws hold the front wire in place. Hardwood triangle stock secures the rear wire.



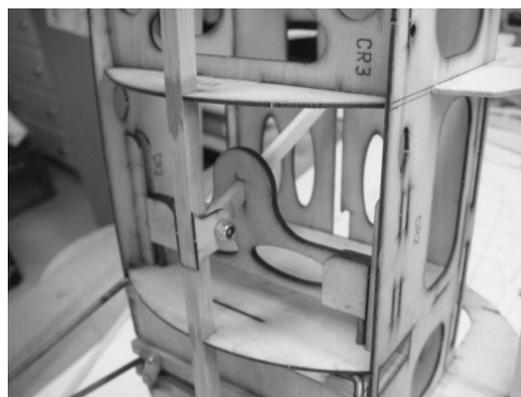
Remove the crutch assembly from the board. Position the remaining fuselage formers on the crutch assembly. Square them to the top of the crutch and glue them in place. The inside slot on F5 may need to be widened to fit properly on the crutch. The plans show the correct size for the slot. Glue two 1/4" square balsa stringers in place on the sides from F2 to F6.



The bottom, center stringer is 1/4" square spruce from F2 to F5, and 1/8"x3/16" spruce from F5 to the tail. Cut and glue this stringer using a 1" long scarf joint at F5 as shown on the plans. Making this stringer out of spruce will help prevent damage if the tail section is propped up on something.



Cut the lower hatch edges from 1/16" basswood sheet. These are cut oversize and should hang over the outside edge of the fuselage formers. Glue them in place from F2 to F6.

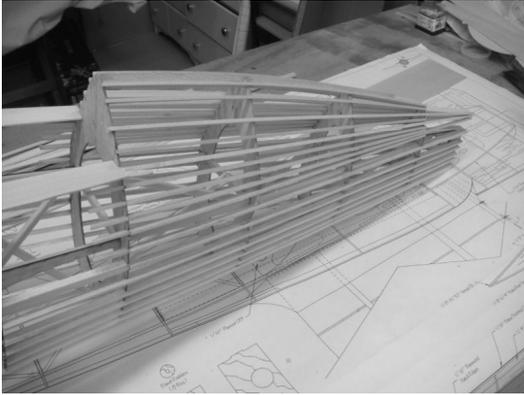


Cut the wing latch lever from 1/4" square spruce. Narrow approximately 1" of one end to 1/8" thick to fit through the slot in CR1. Drill the other end for a 2-56 bolt and locknut. With the lever in place, trial fit the latch mounts on the bottom stringer. With the carriage fully forward, you want the lever to fit tight against the locking notch. Glue the mounts in place. Fit the wings, and make any final adjustments at this time.

There are six 1/16" plywood wedges. Glue them in stacks of 3. These wedges are glued to the inside top of the spar box and fit tightly against the top of the spar joiner. They transfer any load from the spar joiner to the spar box and crutch structure.

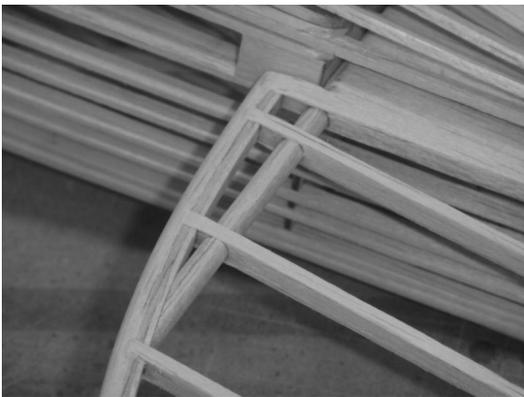
Glue two balsa blocks to the rear of F3 and against the CR2 for flying wire mounting locations. We used some 1/8" inside diameter brass tubes as mounting points.

Wedell-Williams Model 44



The fuselage stringers are 1/8"x3/16" balsa. Wherever the stringers will meet sheeting at F5 and F6, they are notched so that they will extend 1" under the 1/16" sheeting. Alternate from the left side to the right side while gluing the stringers in place to avoid building a twist into the fuselage. At the tail where several stringers converge, cut some of the stringers short and round the ends so they will blend in under the covering.

Insert the wings and trial fit the stabilizer. The stab is glued to the tops of the 1/8"x1/4" spruce longerons.



Add some scrap balsa filler around the stab to aid covering later. Glue tail support TS1 in place to the bottom of the stabilizer and between the stringers. Trim the stringers flush with the T.E. of TS1. Do not glue them yet.



Fit the fin assembly and square it to the stabilizer. The L.E. of the fin is glued to the top stringers and the T.E. is glued to TS1. With everything square, glue the rest of the stringers to TS1 and sand them to blend in with the T.E. of the fin.



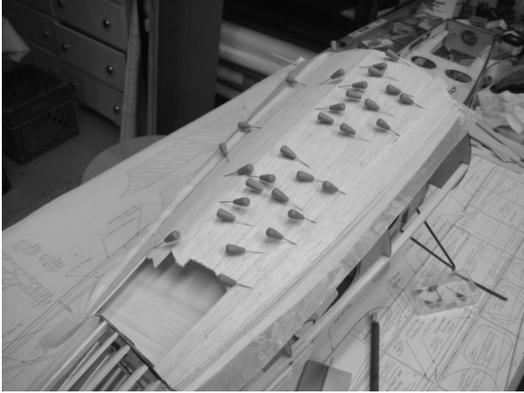
Glue Tail skid TS2 in place on the bottom of the fuselage. Face both sides with 1/16" balsa and round the edges.



The hatch assembly is built in place to ensure a perfect fit. Laminate the two F6A's together. Protect the lower hatch edges with

Wedell-Williams Model 44

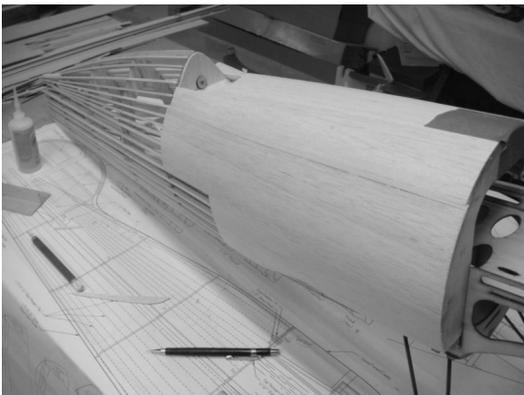
wax paper. Position the 1/16" basswood upper hatch edges and glue F2A, F4A, F5A, and the F6A assembly in place. Add a 1/4" square balsa stringer to the tops of the formers. Glue 1/4" balsa triangle stock in place from F2A to F6A.



The hatch is planked with 1/16" balsa. Butt the edges of the planking to the triangle stock on each edge. Make sure you can get the hatch off.



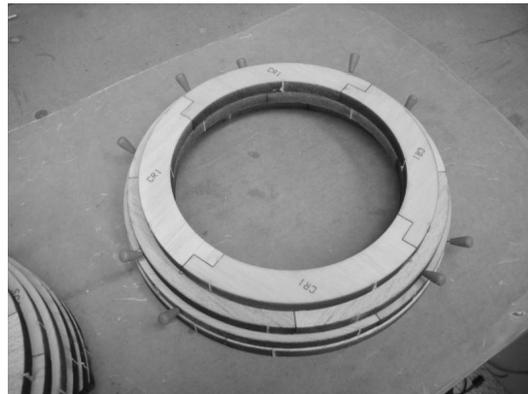
Sheet the forward portion of the fuselage from F2 to F5/F6 with 1/16" balsa.



Plane/Sand the basswood hatch edges flush with the fuselage and hatch sheeting. The basswood will give a hard edge that will stand up to daily flying.



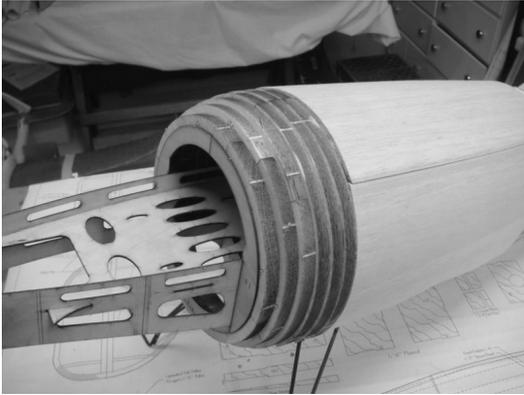
A simple latch mechanism can be fashioned from some music wire, Ny-rod tubing, and a spring from a ball point pen.



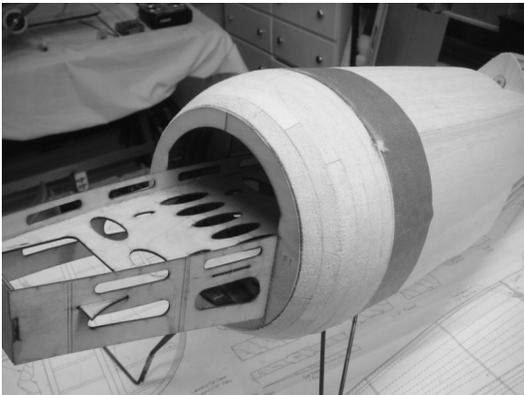
Laminate the cowl rings and the sub cowl rings. Use the inside edges to align the rings. The lower portions of SC4, SC5, and

Wedell-Williams Model 44

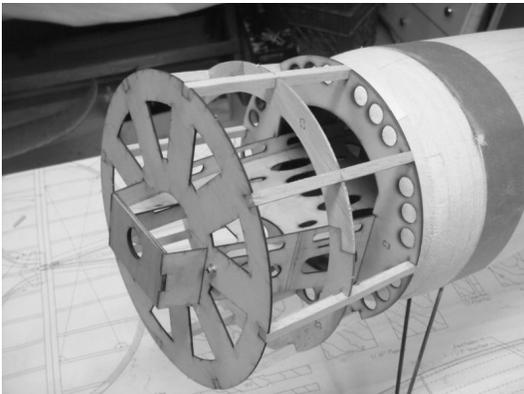
SC6 are separate from the rest of the sub cowl.



Fit the lower portions of SC4-6 in place and glue them to the front of F2. Glue the sub-cowl rings to the front of F2. Glue the F1s to the front of the sub-cowl and to the CR2's.

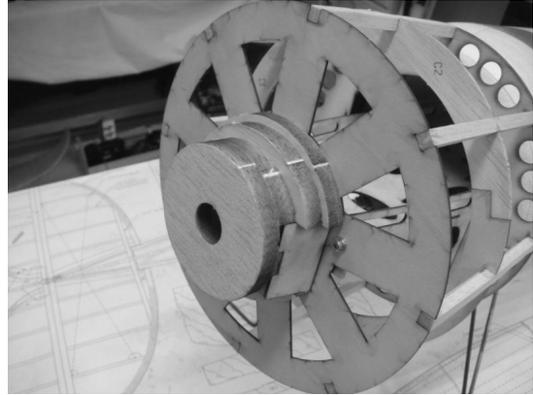


Use the laser cut edges as a guide and carve/sand the sub-cowl to shape.

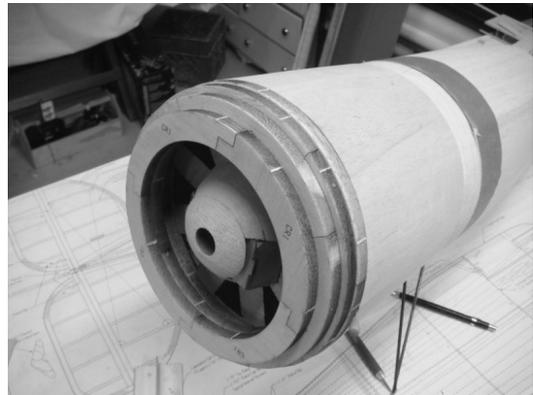


Glue C2 together. Position C1, C2, and C3 on the front of the fuselage crutch. Drill two

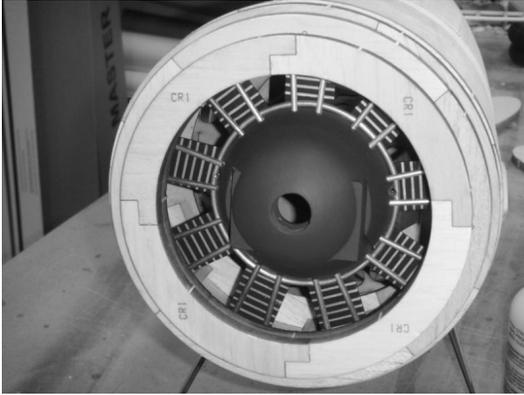
holes through C1 into the cowl mounting plates. Secure C1 with two bolts and blind nuts. Cut 7 1/4" square balsa stringers to length as shown on the plans. Make sure they are all the same length and mark the center of each stringer. Glue them to C1 and C3. Use the center marks to line up and glue C2 in place.



There are several half round balsa pieces that are glued together to form the crankcase of the dummy engine. Carve and sand them to shape.



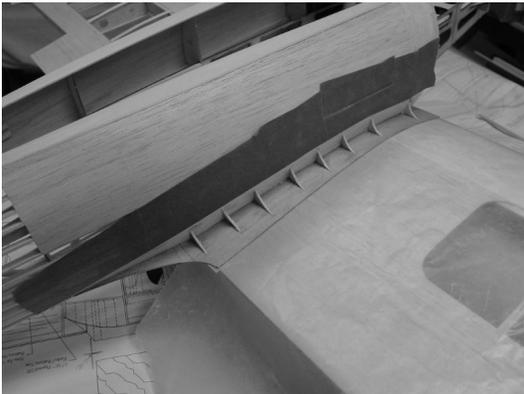
The cowl is sheeted with 1/16" balsa and the trailing edge is reinforced with a 1/64" plywood strip around the inside.



This is a good time to detail the dummy engine; we used some 1/8" aluminum tubing and paint. Once this is done, the cowl rings are glued in place and sanded to shape.

Wing Fillets

With the wings installed and protected with wax paper, fit the 1/64" plywood wing fillets outline to the fuselage. The outlines should touch the CR2s, and are glued to the formers and sheeting.



Protect the fuselage sheeting with masking tape, and glue several balsa triangles to the outlines and fuselage sheeting. Use a round sanding block to shape the triangles to blend them into the fuselage and wing.



Using 1/16" balsa, plank the wing fillets with thin strips. The forward portion is carved from balsa block.

Landing Gear and Wheel Pants

The wheel pants are built up from 6 layers of 3/8" balsa. Note that the wheel opening is different on the center laminations. The larger wheel openings should be in the center, with the smaller wheel openings on each side.



Inset the 1/16" plywood wheel pant supports into each side of the wheel pants. Install wheel pant mounting hardware and glue on the 3/8" balsa outer layers.



Carve and sand the wheel pants to shape. Fit the wheel pants to the landing gear.

The L.G. fairings are made from two layers 1/16" balsa with 1/8" balsa sandwiched in between. Cut the 1/8" balsa to fit around the L.G. wires and glue them to one of the 1/16" balsa sheets. Fit the assembly around the L.G. wires and glue the other 1/16" balsa sheet in place.



Sand the L.E. of the fairing round. We added an 1/8" spruce dowel through the fairing into the wheel pants to hold everything in alignment. Glue 1/8" I.D brass tubes in place for flying wire mounts.



We used some 1/64" plywood between the fairing and the fuselage, and built up a small fillet with an epoxy/micro balloon mixture. The same was done at the wheel pant end as well.

Flying Wires

The flying wires are one of the signature characteristics of the Model 44. We used some chrome, plastic lacing cord available at craft stores (Brand name Britelace).

At each mounting point, install an 1/8" I.D. brass tube. The cords are secured to the bottom of the fuselage, run through the wheel pants, up to the wings, and back to mounting points on the lower hatch edges. An 1/8" outside diameter aluminum tube is CA'd to the ends of the cords and keyed slots in the hatch edges trap them. The following photos show how it is done.

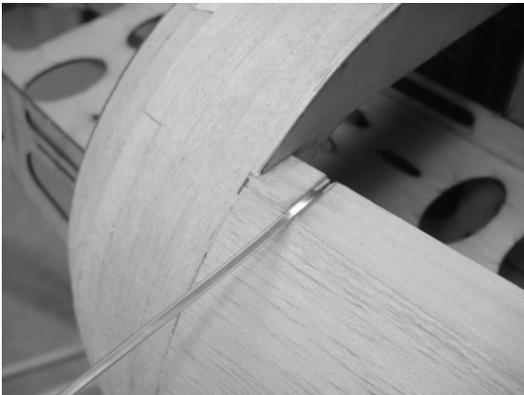


1/8" Aluminum tube glued to ends of cords.

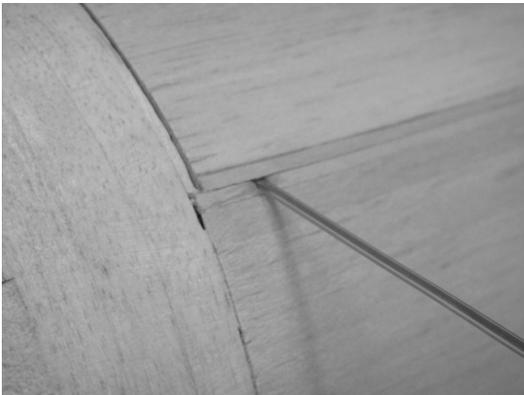
Wedell-Williams Model 44



Keyed slot in lower hatch edges trap the tubes.



Slots filed in the hatch edges allow the hatch to fit tightly.



Final Assembly

There were several color schemes for the Model 44. No. 44 "Miss Paterson" is red and black with gold pin striping. No. 92 was white and black, and was even painted up as the "Lester Special" for the movie "Tail Spin". A third Model 44 saw service as the Gilmore Red Lion and later had race number 57 and was all gold. Each of these planes was seen in many configurations, so do your research. The markings of No. 44 are shown on the plans and vinyl graphics are available from Callie Graphics (www.callie-graphics.com).

This is a scale plane, and as such there are very few flat surfaces. Take your time covering. Any of the iron on coverings are fine and should replicate the 30 cotes of hand-rubbed dope that the full size Model 44 had.

The cockpit is rather shallow, but you can fit in a few gauges on the dash boards and the head of a Williams Brothers 1/6 scale pilot. Mount the canopy and rig the flying wires.

For power and radio setup, we recommend the following:

Hacker A30-10XL
14x7 APC Electric Prop
3S x 3300mAh Lipo
CC Phoenix 45 ESC
Optional: Switching BEC
(2) HS-65 servos for rudder and elevator
(2) HS-55 or HS-45 servos for ailerons

Make sure to double check the C.G. The model 44 has a small stabilizer, and as such is sensitive to a rearward C.G.

The motor does require a bit of right thrust. We used a few washers between the motor and firewall for shims.

Flying

The tail skid and the long tail moment do make taxiing around a bit difficult on grass. The Model 44 tracks straight on takeoff and the throttle can be slowly advanced. It is easily airborne at a little over half throttle.

The Model 44 is not blinding fast (probably due to the flying wires.). However, it does have presence in the air. The Model 44 as built has a light wing loading and no bad stall tendencies. In fact, it is difficult to get it to stall.

The model 44 makes a nice sport plane. Loops, rolls, Cuban-8's, stall turns are within its capabilities. Snaps and spins are more difficult due to the mild stall behavior.

The flying wires do cause some drag, and you will need to carry some power through turns and on final approach. This is one plane that you do want to carry power all the way to touch down.

Wedell-Williams Model 44

Disclaimer

Jim Young and T&J Models accept no responsibility for crash damage and/or loss of kits, engines, accessories, etc. incurred during operation or building of a Jim Young and T&J Model's radio-controlled model. In most cases it is very difficult or impossible to determine whether crash damage was actually due to radio equipment failure or to operator error.

It is impossible to guarantee product compatibility for product recommendations. We provide information and suggestions to the best of our abilities based on the information available to us at the time. We are unable to guarantee successful outcomes.

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Model airplane performance claims typically apply to density altitudes under 3,000 feet above sea level. If you will be flying your airplane above this, additional considerations such as motor power, choice of propeller and aircraft weight should be taken into consideration.

Additional policies may exist. Policies are not limited to those on this page. Call with any questions

Waiver and Release from Liability

I HEREBY ACKNOWLEDGE that I understand that flying model aircraft is an extremely dangerous activity and may result in injury and or death, even when practiced by a competent pilot using proper equipment. I further acknowledge that I am aware of and understand the types of hazards and dangers, both real and hidden, involved in flying model aircraft and accept any and all of the risks of possible injury or death. I understand that the model aircraft products manufactured and distributed by Jim Young and T&J Models have not been designed, manufactured or tested to meet any federal or state government air-worthiness standards or regulations. I understand that flying model aircraft is an extremely demanding activity requiring exceptional levels of attention, judgment, maturity, and self discipline, requiring me to make a conscious and continual commitment to my own safety and the safety of those around me. In particular, I understand that gusty winds or turbulence may interfere with even an expert pilot's ability to safely control flying mode aircraft and thereby cause it to crash.

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I VOLUNTARILY ASSUME all risks, known and unknown, of any injuries, personal or financial or of wrongful death, however caused, if caused in part or in whole by the action, inaction or negligence of any of the released parties named above to the fullest extent of the law. I represent that I am at least 18 years of age and I acknowledge that I have read this agreement, fully understand the potential dangers of engaging in flying model aircraft products from Jim Young and T&J Models and am fully aware of the legal consequences of accepting this agreement. I understand and agree that this document is legally binding and will preclude me from recovering monetary damage from the above listed entities and or individuals, whether specifically named or not, for personal injury, bodily injury, property damage, wrongful death or any other personal or financial injury sustained by me in connection with the use of any model aircraft product from Jim Young and T&J Models.

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