

T&J Models

R/C Model Designs By Jim Young

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MIG-17



"A SHARK FIN ON A BOOMERANG"

The Mikoyan-Gurevich Mig-17 is the follow on of the more famous Mig-15, one of the first successful swept-wing jet fighters. It was designed to fix any combat problems found with the Mig-15. The result was one of the most successful jet fighters prior to the introduction of true supersonic planes. The Mig-17 is longer than the Mig-15 and was the first use of an afterburner in a Soviet fighter. 8000 Mig-17's saw service from the early 1950's through the 1960's by twenty countries. There are almost 30 privately owned Mig-17's in the United States, with several pulling airshow duties, giving many options for color schemes.

This Mig-17 is designed around the Great Planes Hyperflow EDF unit(GPMG3910) and the Ammo 24-45-3790 brushless motor (GPMG5185). This economical setup gives nice EDF performance on a 4S 2200mAh LiPo battery pack. The outline is true to scale with the exception of larger ailerons and the position of the stab to simplify construction.

Construction

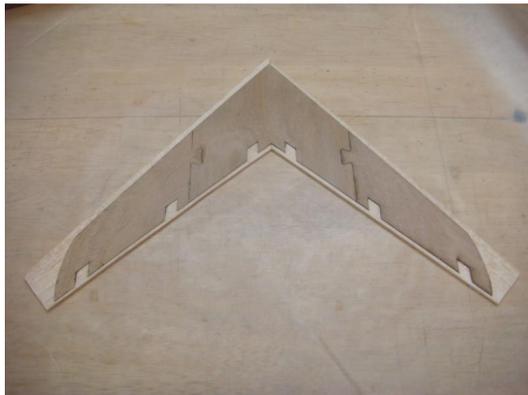
The construction of this model requires some advanced level of modeling experience. All of the major parts are laser cut, and the builder is left to select wood and hardware to complete the model.

Materials List

The following is list of the major pieces of wood and hardware needed to complete the model. Additional wood may be required.

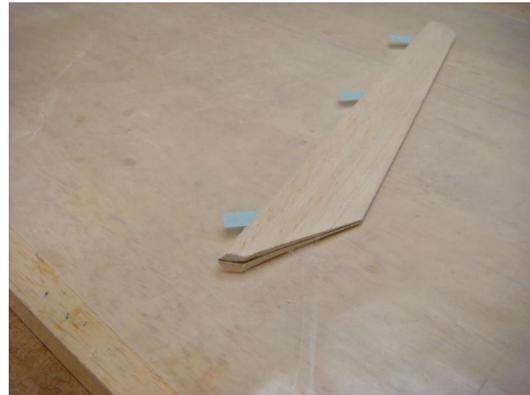
- (5) 1/16" x 4" x 36" Balsa Wing and Fin Skins
- (2) 1/16" x 1/4" x 36" Basswood Rear Spars
- (1) 1/16" x 1/2" x 36" Basswood Wing L.E.
- (1) 1/4" x 1/2" x 16" Balsa Aileron L.E.
- (1) 3/16" x 1/2" x 36" Balsa Wing L.E.
- (4) 3/32" x 4" x 36" Balsa Fuselage Planking
- (1) Sullivan #507 Flex Cable
- (1) 1/32" x 36" Music Wire
- (1) 1/4" x 24" Dowel

Tail Feathers

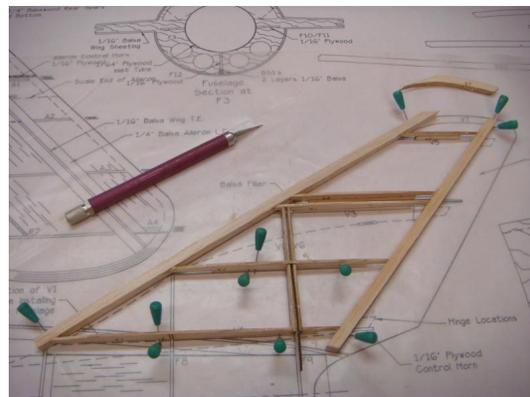


The stab and elevator are 3/32" balsa laminated around a central core of 1/64" plywood. The grain of the balsa should

run parallel to the trailing edge of the stab. The plywood provides a "joiner" between the two halves of the stab and slots for CA type hinges. Add a small strip of light weight (0.5oz) glass cloth to the center of the stab to reinforce this joint. Taper the elevators and round the leading edge of the stab. Bevel the L.E. of the elevators, glue the control horns in place, and temporarily hinge the control surfaces.



The rudder is laminated in a similar fashion with 1/8" balsa on both sides of the plywood core.

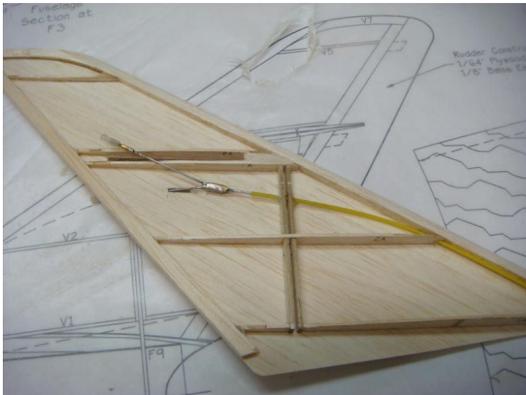


The fin is built up and has features to slide on to the fuselage formers. Sand the front of each rib to match the angle of the L.E. Pin the ribs in place over the plans and glue the 1/4" balsa L.E. and T.E. Glue the V6's in place using scrap 1/16" plywood to make sure the gap is

correct. Glue the V7 fin tips in place. Plane and sand the T.E. and tip to match the ribs.



Sheet the fin with 1/16" balsa. Remove the fin assembly from the board and cut an opening for the stab between V3 and V4. Add scrap balsa blocks at the front and rear of the slot to fit close to the stab.

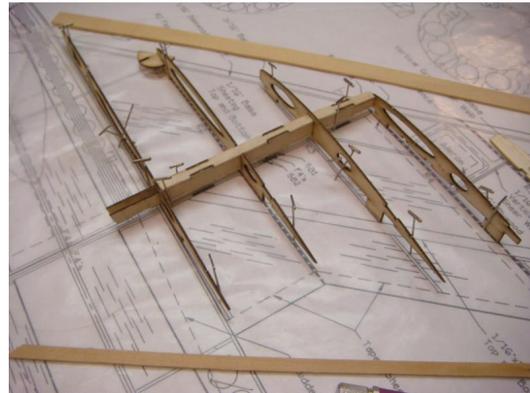


Install the elevator flex cable as shown on the plans. Remove the building tabs from the ribs and sheet the other side. Cut an opening in the sheeting between V3 and V4. Glue the stab in place, making sure it is square to the fin. Temporarily hinge the rudder and glue the control horn in place.

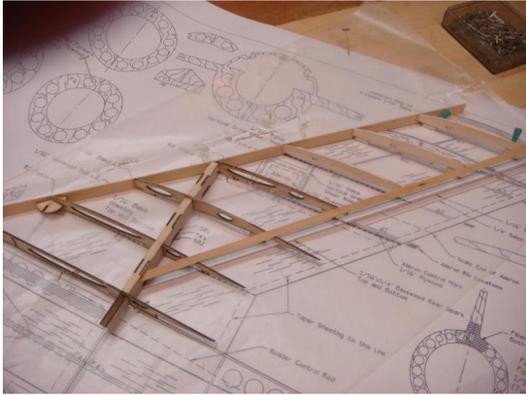


Wings

Prepare the top and bottom wing skins. Edge glue two sheets of 1/16" balsa together. Use the plans to cut the wing sheeting leaving it slightly over sized at the L.E. and root. For the top skin, bevel the trailing edge of the sheeting to the line shown on the plans.



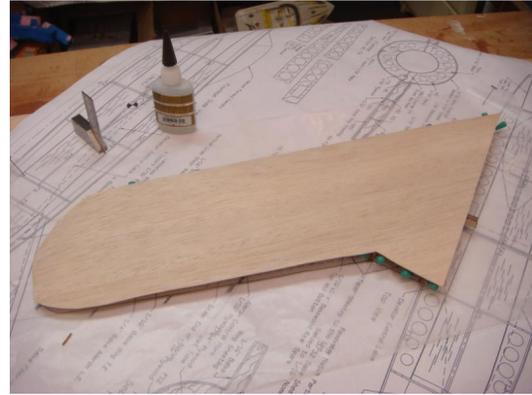
Glue the balsa spar box top and bottom (SB1) to the plywood spar box sides (SB2). Use two layers of scrap 1/16" plywood between the sides to ensure the spar will fit. Position R2 on the spar box and glue it in place up against the tabs. Slide R1 and R3 on to the spar box and glue in place. Glue the outer spar box top (SB3) and bottom (SB4) in place. Sand the outboard end of the spar box to match the L.E. Sand the front of each rib to match the angle of the L.E. (make right and left hand ribs).



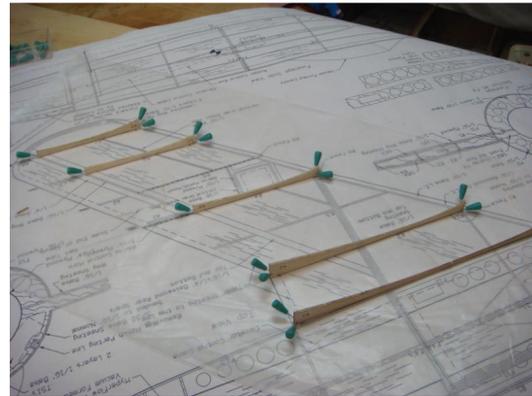
Pin the spar box assembly and the rest of the wing ribs in place over the plans. Glue the 1/16"x1/4" basswood rear spars in place.



Glue R2A in place making sure it is level with the board. Glue the 1/16" balsa T.E. in place and sand the top to match the rear spars. Glue the 1/16" basswood sub-leading edge and plane/sand it flush with the ribs. Note there is a slight bend in the L.E. at R4 and it should taper slightly outboard of R7. Glue the top sheeting in place, and trim it flush with the L.E.



Remove the wing assembly from the board. Use pinholes to locate R2, R4, and R5 for the wing-fences.

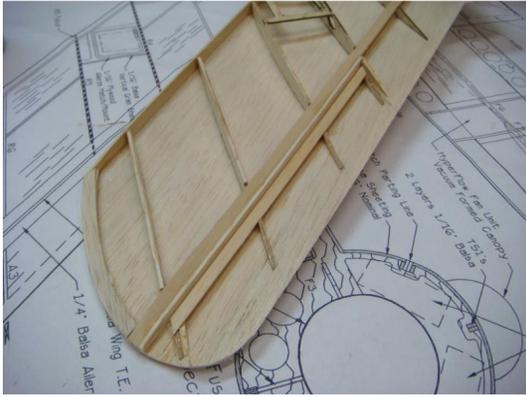


Jig the wing up-side-down over the plans. Make sure the wing is properly pinned down and touching all of the jigs to set the correct washout.

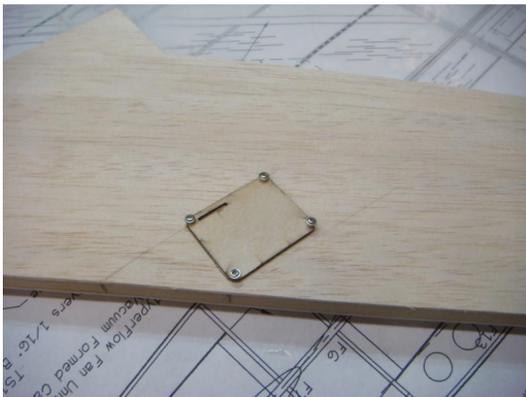


Glue the 1/16" plywood servo hatch mount in place. At the L.E. make sure

the mount is even with the surrounding ribs. Laminate the three layer wing tip flat, and then glue it to the top sheeting. The top sheeting will bend to the wing tip. Sand the wing tip to match the ribs.



Mark the location for the aileron ribs using the marks on the plans and the angle gauge. Sand the 1/4" balsa aileron L.E. as shown on the plans. Glue the aileron L.E. to the top sheeting followed by the aileron ribs. Use pin holes to mark the location of the aileron. Plane the sub-leading edge flush with the ribs.



Glue the 1/16" balsa bottom sheeting in place. Use a pin to locate the servo hatch mounting holes. Use the 1/16" plywood servo hatch as a template to remove the bottom sheeting. The aileron servo is mounted to the hatch. Glue the 3/16" balsa L.E. in place and sand to shape. Locate the edges of the aileron and cut if

free from the wing. Glue the control horn to the end of the aileron between the top and bottom sheeting. Sand the aileron to its final shape. The ailerons are hinged along the top with the covering material. The sheeting at the wing roots will be trimmed to match the fuselage later.

Do I have to tell you to make two wings, a right and a left? I didn't think so, moving on.

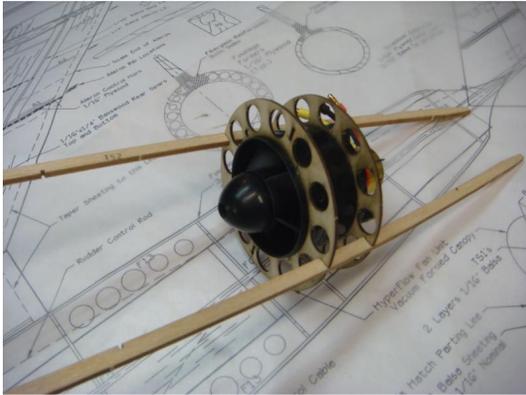
Fuselage



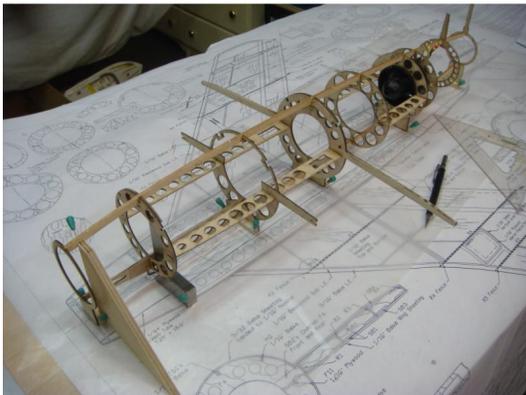
Laminate the two F4's together using 30 minute epoxy. Weigh them down under something flat to ensure a straight and strong wing spar. Glue a small piece of light weight glass cloth on both sides of F8 and F9 around the fin mounts as shown on the plans.



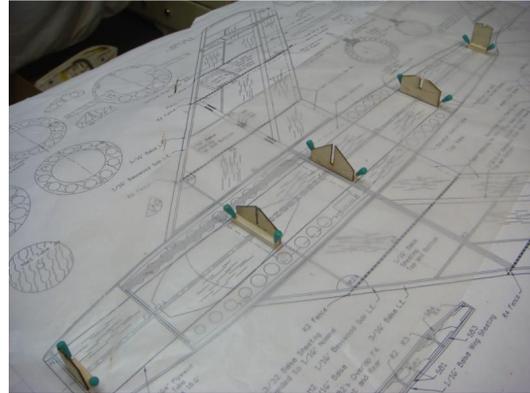
Laminate the top and bottom fuselage stringers. Assemble and balance the fan unit. Test run it and make sure all screws have thread locker on them. Use a hobby knife in a scraping motion to round the inside inlet edge of the fan shroud.



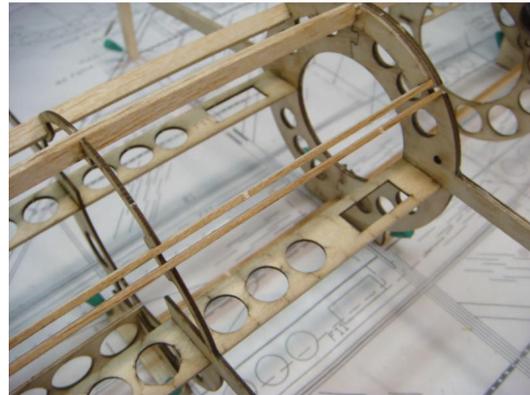
Glue F6 and F7 to the fan unit using the top and bottom stringers to position them. Use the marks on the former and mold lines on the fan to line up the formers.



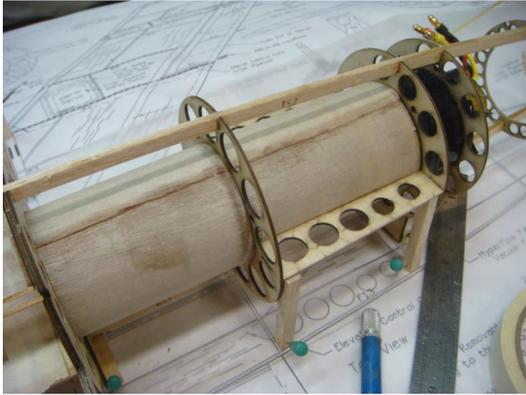
Dry assemble all of the fuselage formers (F1 to F9) to the top and bottom stringers. Use rubber bands to temporarily hold it together. Add the servo and battery mounts (F10 and F11).



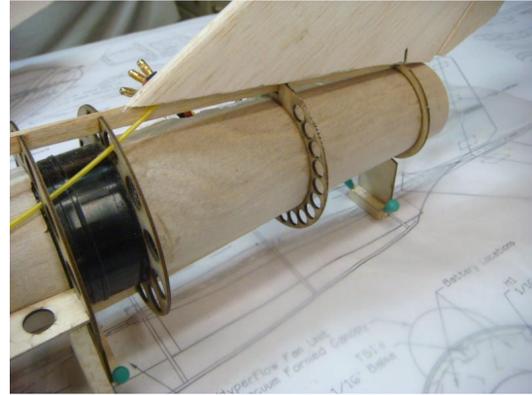
Jig the fuselage over the plans and square each former to the plans. Use thin CA to glue the fuselage structure together.



Glue the hatch formers to the top stringer using 1/64" plywood to space them from F2 and F4. Glue the H1 hatch edges in place. There should be an 1/8" gap between these pieces. Slip wax paper between the hatch formers and F2 and F4.

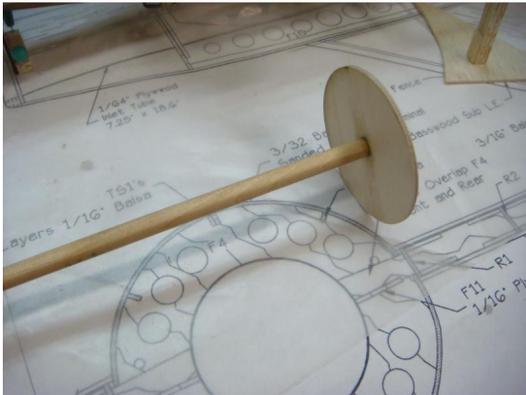


With full inlet ducting, there are considerable forces trying to collapse it during flight. Ensure that the duct material is solid and has no cracks in it and that it is securely glued to all formers. Cut the front and rear ducts from 1/64" plywood. The edges of the ducts overlap 1/4" and are beveled to provide a smooth duct.

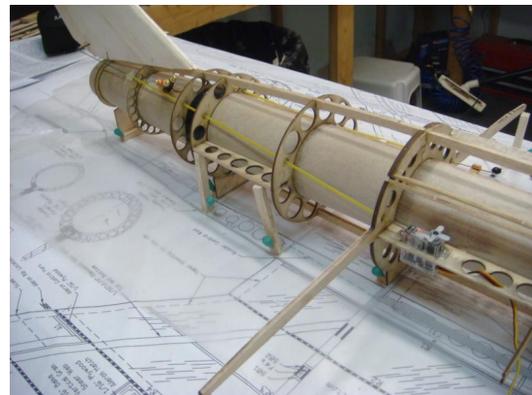
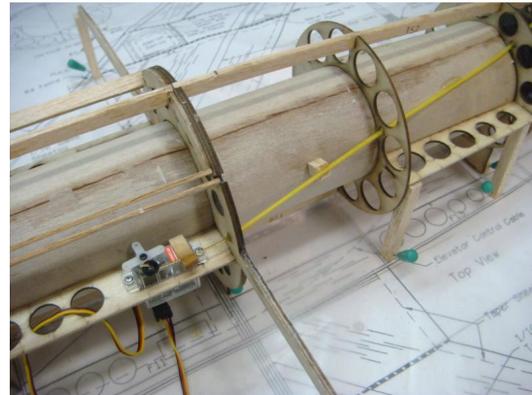


Use the template on the plans and cut and install the outlet duct. Make sure F8 and F9 are aligned and square to the board.

Fit the tail assembly to the fuselage. When satisfied with the alignment apply a liberal amount of 30 minute epoxy and make it permanent.



Insert the ducts in the fuselage and use the jig mounted to a 1/4" dowel to hold it round as you glue the seam. Double check the alignment of the fuselage before gluing the ducts to the formers.



Use the extra outer sleeve from the flex cable and 1/32" music wire for the rudder linkage. Install the motor wires and aileron servo extensions.



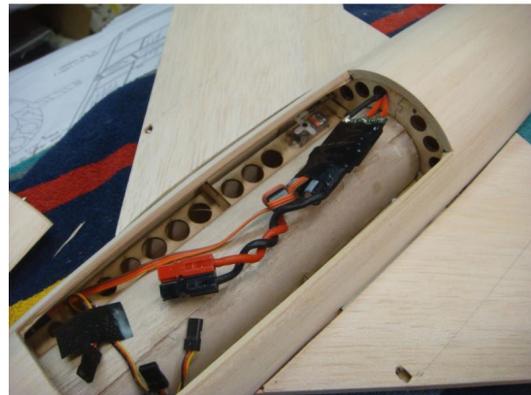
Use the planking template on the plans to cut 3/32" balsa planks. This will help reduce the amount of cutting and fitting. Slightly bevel the edges of each plank before gluing it in place. I've found that using sandable glue along the edges and CA to glue them to the formers makes quick work of this task. Plank the top of the fuselage as far as you can down each side.



Cut partially through the planks around hatch so you can find it later. Remove the fuselage from the board.



Bend the tow hook from 1/16" music wire and epoxy it in F12. Glue 1/64" plywood scraps to trap the tow hook in place. Complete the fuselage planking and sand the fuselage smooth. Cut holes to match the aileron servo lead holes in the wing root ribs and to clear the spar box.

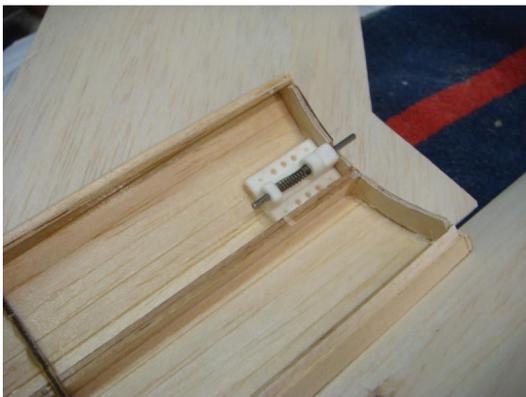


Cut the hatch free and add the forward pin and a rear locking mechanism of your choice. Sand the planking even with the H1's on the hatch and H2's on the fuselage.



Slide each wing on to the spar and mark the wing sheeting with the shape of the fuselage. Trim the sheeting for a tight fit to the fuselage. R1 should touch the fuselage at F4. When satisfied with the fit, apply 30 minute epoxy and slide the wings in place. Jig the fuselage over the plans and pin the wing tip jigs in place. Double check the alignment and let it cure overnight.

Glue a piece of 1/16" basswood to the H1's on the hatch and in the fuselage. Replace the hatch and sand the basswood edges flush with the planking. Trim the canopy to fit the hatch. It is glued in place after covering.



Apply a small fillet around the root of the wing, the fin, and stab. Final sand the airframe and prepare it for finishing.

Final Assembly

There are many color schemes that the Mig-17 has appeared in. You can go with traditional military silver/gray, or the Mig-17 has become popular with several airshow pilots and teams if you want something more colorful. Any of the iron on films should be fine for this little EDF. Glassing and paint is also an option, but keep in mind the 30 oz. target weight.



Wing fences...

Install the radio gear, we used HS-45's all around. The ESC and Rx fit under the hatch. A pair of 2Sx2200mAh packs are wired in series and positioned to balance the model as shown on the plans.

Flying

To keep the Mig-17 light, the landing gear was omitted in favor of bungee launching. This also helps to ensure that it is up to flying speed. If you don't have a bungee launcher, I recommend the Great Planes Bungee Launch Set (GPMA2885). With about 20 paces of tension on the bungee, throttle up and give the Mig a gentle push forward from shoulder height...

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