

T&J Models

R/C Model Designs By Jim Young

9356 Wendover Ct.

Brighton, MI 48116

www.tnjmodels.rchomepage.com

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

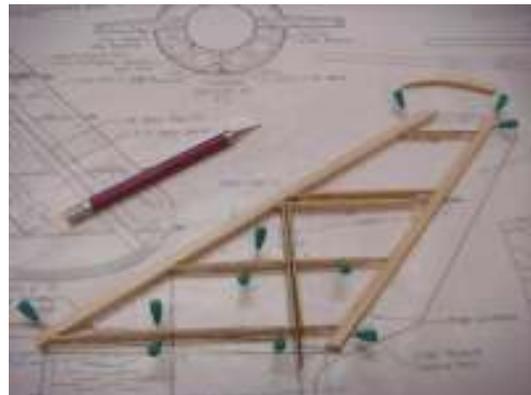


The stab and elevator are 3/32" balsa laminated around a central core of 1/64" plywood. The grain of the balsa should run parallel to the trailing edge of the

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.



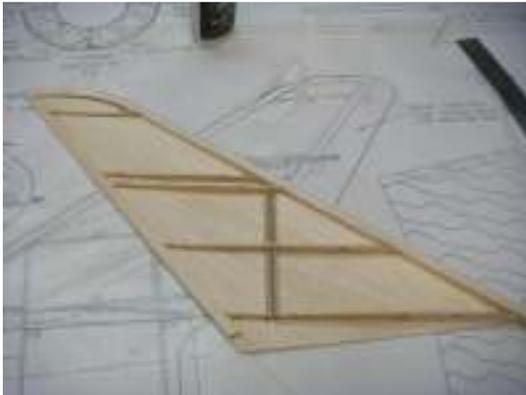
The rudder is laminated in a similar fashion with 1/8" balsa on both sides of the plywood core.



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.

Mig-17

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.



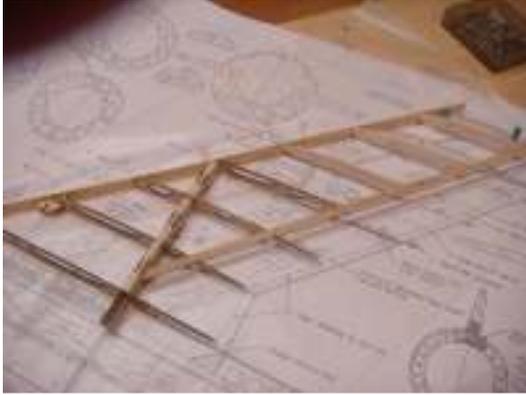
Wings

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).

Mig-17



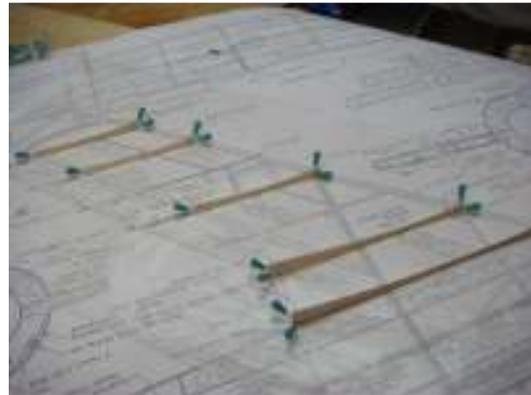
Pin the spar box assembly and the rest of the wing ribs in place over the plans. Glue the 1/16"x1/4" basswood rear spars in place.



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

Mig-17

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.



Mig-17

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.

Mig-17



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.



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 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.



Mig-17

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.

Mig-17



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.



Final Assembly



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.

The wing fences are laminated from two layers of 1/64" plywood. Mark the location of the fences on the wing and use the fences themselves to mark the tab locations on the wing. Use a knife to enlarge slots on the wing so the fences fit flush with the wing. The fences can be installed now if painting or later if covering.



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

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

Mig-17

option, but keep in mind the 30 oz. target weight.

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. The Great Planes Bungee Launch Set (GPMA2885) is recommended. The F13's provide an area to safely grip the Mig behind the wing. With about 20 paces of tension on the bungee, throttle up and release the Mig from shoulder height. It will accelerate quickly with very little drop while on the bungee.

I strongly recommend that for the first few flights you climb to altitude and do some tests at half throttle and apply full up elevator. The high tail position of the Mig can cause the stabilizer to be blanketed by the wing with too much up elevator. If you have too much elevator the Mig will start to tumble. If this happens, apply half power, neutralize the controls, and wait for the nose to drop (hence the need to do this at altitude) and then gently pull out. Reduce the elevator throw as necessary.

With the light wing loading, full power is not needed for mild aerobatics. The stall is gentle and straightforward. Loops, rolls, and point rolls are all within the capabilities. With the C.G. set as shown, inverted flight requires just a bit of down to maintain level flight. When the throttle is pushed the Mig

accelerates quickly and the vertical performance is simply awesome. The recommended power system will easily push the Mig at over 100mph. You better make sure your eyeglass prescription is up to date, because it gets small fast.

The Mig can be slowed down for landings. Keep the wings level on final and use the rudder for course corrections. With the anhedral wing it is easy to catch a wing tip, but the airframe has proven to be quite durable.

I hope you enjoy your vintage jet.

Many thanks to Keith Shaw for letting me bounce ideas off him and for his gifted thumbs on the first few flights.

Mig-17

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.

All of the products sold by Jim Young and T&J Models are intended for retail consumption by our customers and are not intended for resale. We reserve the right not to sell to resellers. Any consequences arising out of the resale of merchandise purchased from Jim Young and T&J Models is the responsibility of the seller, not Jim Young and/or T&J Models. Jim Young and T&J Models may revoke the ordering privileges of customers commercially reselling our products. 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.

I HEREBY RELEASE, AGREE TO HOLD HARMLESS AND INDEMNIFY Jim Young and T & J Models and their agents and employees for any and all liability for any loss, damage, injury or death to myself or to any other person or property resulting from the use of these products and I further agree to waive, and not make any claim or file any suit based upon negligence, breach of warranty, contract or other legal theory. This release, agreement to hold harmless and to indemnify shall be binding upon me, my legal representatives, heirs, legatees and assigns as well as upon all who may be dependent upon or entitled to my services, consortium or support. Should I breach this agreement by filing any such suit or making any such claim, I will pay all attorney's fees and costs of the released parties. I agree that this release shall be governed by and construed in accordance with the laws of the State of Michigan. All disputes and matters whatsoever arising under, in connection with or incident to this agreement shall be litigated, if at all, in and before a court located in the State of Michigan, USA, to the exclusion of the courts of any other state or country. If any part, article, even paragraph, sentence or clause of this agreement is not enforceable, the effected provisions shall be curtailed and limited only to the extent necessary to bring it within the requirements of the law and the remainder of the agreement shall continue in full force and effect.

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.

Copyright

All content of this manual including text, graphics, logos of Jim Young and T&J Models brands, the selection and arrangement thereof are copyright Jim Young and T&J Models. ALL RIGHTS RESERVED and are protected to the full extent of U.S. and International copyright laws. Any other use of this material --including reproduction, modification, distribution, or re-publication--without the prior written permission of Jim Young and T&J Models is strictly prohibited.