PHOTOGRAPHY: MIKE MIDKIFF

# B-25 Mitchell

**By Mike Midkiff**

This rubber powered scale version of the Dolittle raider is a fine flying twin.

The Doolittle Raid will remain in the minds of most older Americans as the first step in the allies taking the offense in the Pacific during World War II. The B-25 Mitchell was selected to strike at the Japanese homeland because of its range, striking power, ease of handling, and short take-off run. The Mitchell, in her many variations, flew in every theatre of the war and in tribute to her simple, efficient ruggedness, could be literally armed to the teeth and deliver as much destructive fire power as a naval destroyer. The ultimate occurred with the G&H Model, which was fitted with a 75 MM cannon mounted to fire straight ahead. Japanese shipping was an especially good target; a direct hit could sink most of the coastal vessels used between the islands.

Culmination of B-25 production came with the "J" Model. A total of 4,390 B-25J's were produced from January 1944 thru the end of the war making this variation the most numerous model of the Mitchell series.

War weary B-25's soldiered on thru the rest of the war and were found on the inventory of many other allied nations in to the post war era. A few spent their last days as radar bombing trainers and some exist to this day as company aircraft, fire bombers and crop dusters.

This model of the Mitchell is surprisingly close to scale in terms of areas and outline. The only deviation that one can "eyeball" is the dihedral angle, but even then it has that characteristic wing "droop" in the outboard panels. The model's all up flying weight, less the landing gear, is approximately 4.5 ozs., which, across a 36″ span, is not too bad a wing loading. My model depicts an average B-C version in three tone color.

The olive drab over medium green upper surface color scheme has not been documented, but I still like the effect of this two-tone green above the grey underside. Many other variations of color schemes exist, even one replete in pink, to satisfy one's aesthetic inclinations.

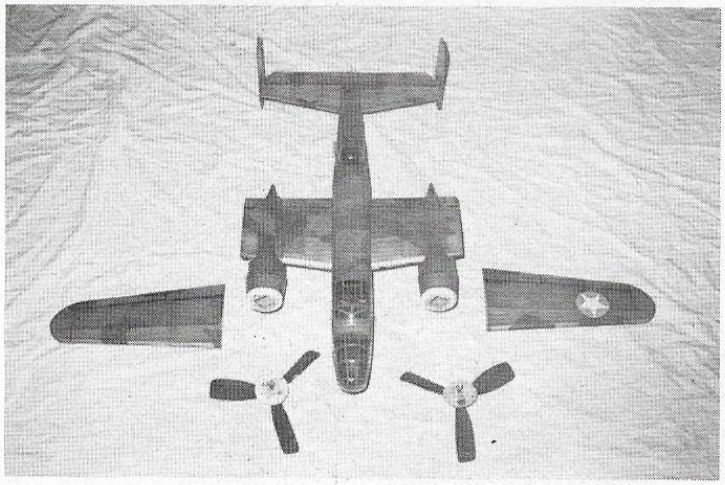
My intent with this model was to produce a practical flying twin-engine rubber powered model aircraft which could be flown without 2 or 3 mechanics required to hold this or that while winding or launching.

## Fuselage

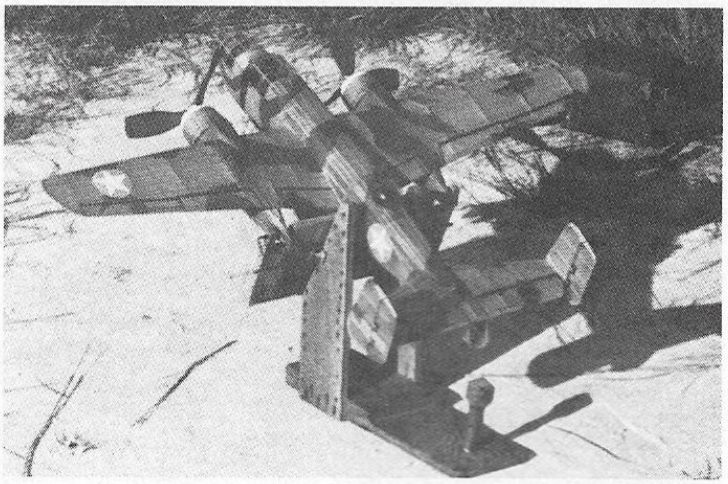
Frame up the fuselage by building two sides directly over the plans, these frames are built from hard, stringy 3/32 sq. balsa. Separate these after they are dry and add the 3/32 cross pieces. Crack the longerons at station #10 to give the angular break as seen in the top view. Add the upper and lower 1/16 sheet balsa formers from station #5 back; also, add the two 1/32 plywood wing spar formers. It is important that these two formers match the spar stubs which protrude from the wing roots. Add the 1/16 wing base sheeting between station #7 and #10. Assemble the 1/32 plywood former at station #1. Remember to slant the top portion toward the front. Now glue in the plywood formers at 2, 3 and 5. Locate and assemble the 1/16 × 1/8 balsa stringers to the top and bottom formers and the 1/16 sq. stringers over the side framework back to former #15. Use 1/16 sq. spruce stringers in the nose "green house" area where the window framing is located; these run from former #1 to #4. These spruce stringers up front will provide needed strength in this relatively fragile area. Plank in the bottom front from station #5 forward with soft 3/32 sheet balsa between the stringers. Wrap the cowl section between stations #4 and #5 with 1/16 sheet, add the landing gear tubes in the nose sheeted area and the side 1/16 balsa sheeting over the framework from station #4 forward. This completes the basic fuselage structure.

## Wings

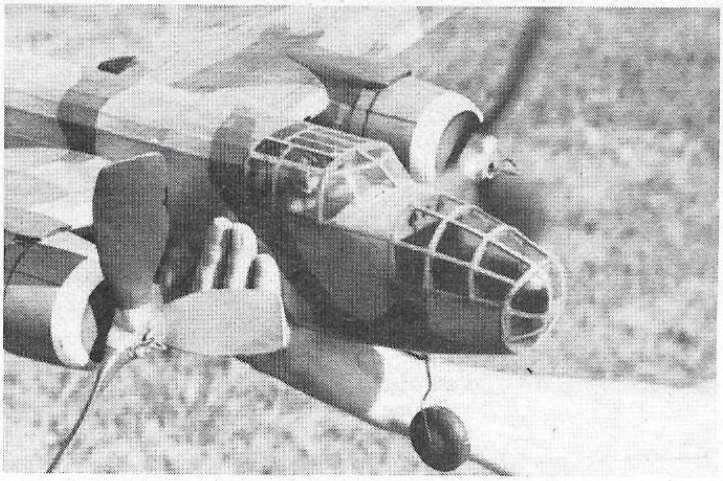
The wings are built in the conventional manner except the outboard panels at the dihedral break are removable. This provides for some knockoff and ease of transportation. Pin down the leading and trailing edges and the laminated wing tips. The root rib #1 is made from 1/8 sheet, the two #4 ribs at the

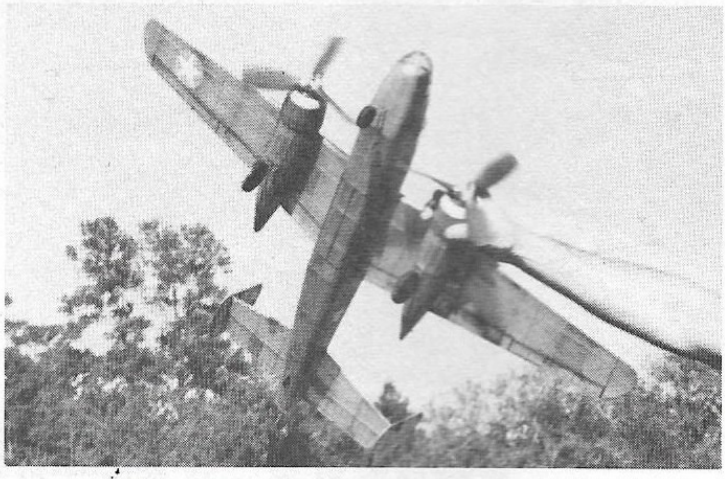


**B-25 disassembled** for transportation (**above**). Note that wing tips unplug just outboard of engine nacelles. Three blade props are hand carved. Detail shot of nose of B-25 (**below**). Note cockpit, nose wheel and prop construction.



**Author's winding stooge** for B-25 includes a jig to hold plane in proper position (**above**). Text explains how props are kept from spinning until ship is launched. Main gear mounts to nacelles, nose gear to fuse (**below**).





wing separation line are made from 3/32 sheet, and all others are made from 1/16 sheet. Assemble all ribs except #1 and the inboard #4; these two are slanted to proved 9/16" dihedral at the #4 rib and 7/8" at the bottom of the wing tip. Assemble these two ribs at the appropriate angles and install all 3/32 sheet balsa gussets.

Now glue all of the wing spars in place. Note that the four wing spars which run from the inboard #4 rib and assemble onto the 1/32 plywood fuselage formers taper from 1/8" at #4 rib to 1/4" at #1 rib. Extend these ends about an inch beyond #1 to glue against the plywood former when assembling the wings to the fuselage. Locate and glue the angle spars which connect at rib #5. These angle spars help keep the outer panel square and rigid.

Cut to length and install the 3/16" aluminum tube and assemble into rib #3 and #4, flush with rib #4, align and assemble the 5/32" aluminum tube to the outboard panel so that it sticks out about an inch to engage the 3/16" tube. Cut and assemble the hardwood dowell, and don't forget the 1/16 balsa doubler where the stub ends of this dowell fits. Make sure that the inboard and outboard panels fit snug together and hold that classic "wing droop" appearance. At this time, check the fit up at the two #4 ribs and, if necessary, slightly move the tubes to correct for any misalignment. Glue the aluminum tubes in securely.

## Nacelles

The nacelle framework is built from 3/32 square medium balsa. Note that the print shows two different locations for the top framework longeron. Build two frames with the top longeron at the lower location and two frames with the top longeron at the upper location. Now assemble a narrow and wide frame together with 3/32 cross pieces to form one nacelle. The narrow frame side must be to the inside of each nacelle. This forms a slope which corresponds to the bottom of the wing surface allowing the nacelle to hang vertically.

Cut out and glue the former sections to the framework of each nacelle and the 1/16 sheet curved aft section of the nacelle. Cut out four 1/16 side keels as shown in the nacelle top view and glue into the appropriate notches cut into the side formers. Add the rest of the 1/16 square stringers and the sheet rear motor anchors. Build up the engine cowls from two 3/32 balsa formers wrapped with soft 1/16 sheet balsa. Align and glue these onto the front of the nacelle framework. Now make up two 1/8 sheet balsa nose blocks with 3/16 thick key blocks glued to the back of each. These should be a snug fit into the opening cut into the former "B". Lastly, glue 3/32 sheet balsa in between the bottom stringers to support the landing gear aluminum tubes.

## Propellers

The plans and photographs show two three-bladed contra rotating props which seem to work well on the model. I am sure right hand, two-bladed props would also work with appropriate trim changes. However, if you would like the challenge of contra rotating three-bladed props, here is how it's done. Carve out six identical prop blocks as shown on the plan. Epoxy three each of these blocks together at the angle cut to form two sets of props. Epoxy 1/32" × 5/8" diameter plywood reinforcing discs to the front and back of each prop set. Carve out each blade as you would a standard two bladed prop. Remember to carve 3 left hand blades on one set and 3 right hand blades on the other set. The left hand prop is used on the right nacelle and vise versa. This provides for ease of holding both props with one hand just before launching.

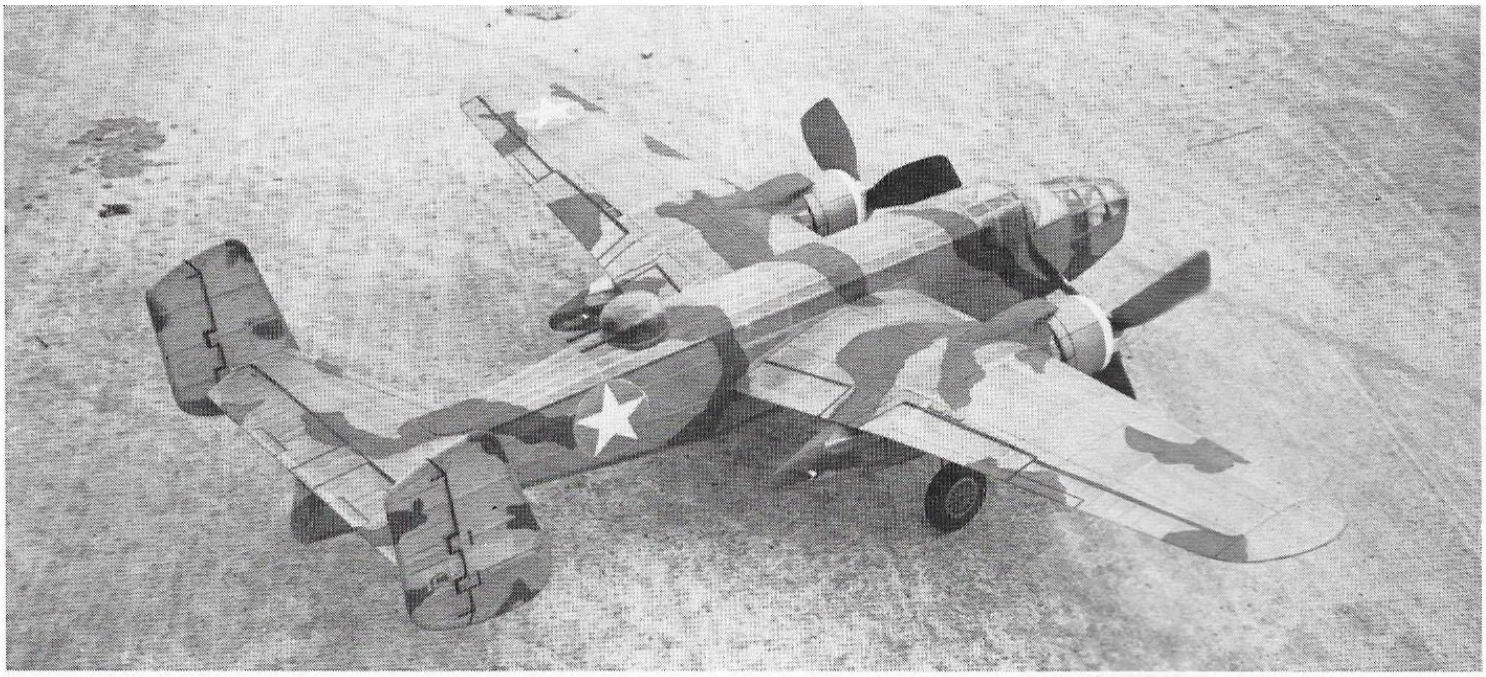
## Stabilizer & rudders

Build the stabilizer in the conventional manner. The ribs are made from 1/16 × 1/4 balsa and an airfoil is sanded into the top of the stabilizer after it is assembled and lifted up from the building board. Note also that the stabilizer tips fit "tongue and groove" into slots in the two rudders so these tips need not be rounded off.

The two rudders are simple, flat structures built entirely from 3/32 square and sheet balsa with 3/32 × 1/16 spar and ribs.

## Covering and assembly

Sand all of the structures to remove glue lumps and other protrusions which would mar the covering appearance. Apply three coats of full strength clear dope to all wood areas which will be in contact with the tissue, sand lightly with 350 grit sandpaper after each of the first two coats of dope. Cover the two rudders, the four-wing panels, the stabi-



lizer and nacelles with appropriate Jap tissue. I used grey domestic tissue on the undersides of the wing, stabilizer and nacelles and green Jap tissue on the rudders, tops of the wings, stabilizer and nacelles. Now assemble and glue the covered inboard wing panels to the fuselage, being careful to align the wing panels with the right amount of dihedral and wing incidence on each side. The dihedral should be 9/16" at the #4 wing rib, and the wing incidence should come out at 2 degrees with respect to the fuselage centerline. Glue the root rib and 4 spar stubs of each wing securely to the fuselage mounting plate and plywood formers. Make sure of the alignment of one wing to the other before the glue sets. Glue the nacelles to the appropriate location on the under side of each wing. Make sure that they run parallel to each other and with the fuselage maintaining a 4 1/8" nacelle centerline distance to the fuselage side. This provides adequate prop clearance and yet is close enough for the props to be held with one hand on the fuselage. Now cover the entire fuselage; cover the bottom grey first so that the green on the sides overlaps the grey at the color separation line. Water shrinks all tissued areas.

Vacuum form the bombadeer's forward glazed area, the windshield, top turret and rear observation bubble. Assemble gun butts and turret ring inside the top turret, stick the .50 cal. guns made from dowel or tubing through the turret into the gun butts. I used small amounts of Hot Stuff to glue the various vacuum formed parts in place. Make the canopy with a single wrap of acetate sheet and the nose section between formers 1 through 4 with three separate wraps of acetate sheet.

The gaps between the nacelles and the wing leading edge are filled with small balsa pieces and the airscoops are made from soft balsa. Make the wheels from balsa sheet and the wire landing gear from 1/16 diameter music wire. Make sure they fit the locations where the aluminum tubes are located. Align and glue on the stabilizer and fill in the top center section between the stabilizer and #13 with soft balsa. Clean out the slots from the rudders and glue these onto the ends of the stabilizer.

## Finishing

Dope the fuselage and nacelles with four coats of 50/50 clear dope to thinner ratio and the wings, rudders and stabilizer with three coats of the same mixture. I used coach green railroad paint, which seems to cover quite well in one coat, to paint on the olive drab blotches. After the green is thoroughly dry, brush on one more coat of 50/50 clear dope all over, being careful not to smear the olive drab. The various control surface outlines are done with a fine point "Sharpie" marker. The glaze framing is two layers of colored tissue strips. The insignia is sprayed on using Polly-S water base paint. The yellow serial numbers on the rudders are from Micro Scale decals.

**Mike's B-25** rests on tarmac before another F/F "mission" over the local field (**top**). A very pretty and airworthy Twin. Scale detailing like machine gun bubble and "camo" paint job looks great (**above**). Classy.

## Trimming and flying

Make up two rubber motors from 1/8" wide rubber. Each motor should have six strands and be from 15" to 20" long. Both motors must be the same length. Install a motor in each nacelle and put on the nose block/prop assembly. Balance the model and add weight to achieve a center of gravity, approximately 30% back from the leading edge. Shim each prop block to produce 3-4 degrees of down thrust. Start test flying without the landing gear and over the softest grass you can find. Initially wind the motor to 150-200 winds and get the feel of holding the props and launching a twin while under minimum power. Mine has a hole in the right prop block at about six o'clock to hold a 1/4 prop stop dowel. Launch the model level and observe whether she stalls, turns or dives. If the model stalls, recheck the center of gravity or add more down thrust; assuming that there are two degrees decalage between the stabilizer and wing. If she turns, add a little more down thrust to the opposite nose block from the direction of turn. If she dives, recheck the center of gravity and the decalage to assure two degrees difference between the stabilizer and wing. Wind in more power and launch again. Look for any deviation from a circling climb to the right or left. If the model stalls, add some down thrust to the inside turning nacelle. If the model flies straight away, remove some down thrust from one nacelle. Trim to achieve a turning climb to either the right or left, followed by a flat turning cruise and glide. With the low wing loading and generous wing area the Mitchell can easily thermal under the right conditions. I've had mine up to about 200 feet and it is quite a sight!