



MOONEY MITE

By WALT MOONEY . . . First of all . . . no relation. Walt's full-size creation was the "Honey Bee." This is a M.I.A.M.A. nine-inch-fuselage-rule Peanut. Clean lines and no gear means long outdoor flights.



• Here is a "Miami Rules" Peanut model of the first airplane built by the Mooney aircraft corporation after World War II. It was not the first airplane designed by Al Mooney, but it was one of the earliest to bear his name. It was followed by a large number of slightly different production Mooney Mites and then a lot of follow on Mooneys, such as the Mark 20, Mark 21, 201, etc.

The prototype Mite lends itself well for a free flight scale model effort, especially if the event, like Peanut, allows hand launched flights so that it can be built with its landing gear "retracted." The prototype was powered by a four-cylinder Crosley automobile engine, which results in a long narrow nose. Production versions had Lycoming or Continental aircraft engines, with their four cylinders exposed, two on either side of the cowl, which would add a lot of complexity to the front end as well as weight and drag.

The model in the photos will average about thirty seconds in flight and has proven to be very stable. It is slightly nose-heavy with the plastic propeller shown, which helps the stability, but requires about an eighth-inch of up-elevator to trim out. Lifting the aft end of the horizontal tail also tilts the vertical

tail slightly forward but this is OK on this model. The whole back end of the fuselage of the real Mites, including the horizontal and vertical tails, tilted for pitch trim. The model with a seventeen-inch loop of 3/32 rubber, weighs 11 grams and balances at the point shown. A lighter, larger balsa propeller (that I'm going to have to carve some day), would probably make the model fly significantly longer.

Although the model Mooney Mite is relatively simple, there are a few areas that need to be discussed. The main fuselage structure is built over the plans with two sides being constructed one above the other so they are identical. Note that there is only a single member at the bottom aft end. This is because when the two side frames are being built into a box by the addition of one-sixteenth square cross pieces, there is none at the bottom of the last upright where the fuselage frame has a triangular cross-section.

Because of the rather sharp bend in the aftmost bottom member, it is best made by laminating three pieces of 1/16 by 1/64 balsa over a form.

Top and bottom formers are added to the fuselage frame in the conventional manner. Top and bottom sheeting is

then applied, as well as the fillings of the first two bays of the fuselage sides. Two bottom stringers complete the fuselage structure assembly.

The tail pieces are built directly over the plan. The leading edge has a rounded cross section and the trailing edge is triangular.

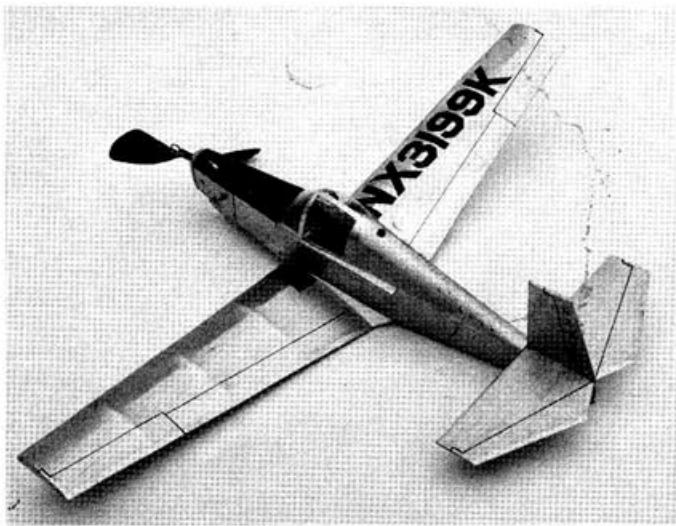
The wing is also built directly over the plan. The leading edge will have to be blocked up a little to fit properly on the ribs. The dihedral break is on the outside of the two root ribs. Do not install the top spar until the dihedral is being created. To do this, cut about half-way through the leading and trailing edges and the bottom spar. With the center section of the wing firmly pinned to the workboard, block up each wing tip 7/8 inch. Put a drop of cement at each of the cuts in the edges and the bottom spar, and then cut and fit the top spar pieces and cement them in place.

If a landing gear is desired, it should be installed at this point. Its location, and suggested length, is shown, but because it is added weight and drag, and is not required for most Peanut contests, it was omitted from the model in the photos. Besides, a landing gear long enough to

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Underside view shows "retracted" gear. Dark triangle aft is access hole to rubber motor.



Prototype Mooney had in-line Crosley four-cylinder auto engine, thus no cylinders sticking out. Retract gear by one action, manual lever.

provide clearance for a reasonable diameter flying propeller, as shown, is out of scale and would look gawky.

The nose block is made up of two pieces of 1/8 sheet balsa, one of which should fit snugly into the front of the main fuselage structure. The two pieces should ideally have their grain directions at right angles. A small Peck Polymers nylon thrust bearing is installed in the nose block.

Do not attempt to cover your model until all the assembled components have been carefully sanded and inspected to make sure there are no unsightly bumps or glue spots, etc., that would adversely affect the final finish of the model.

When covering this model, make sure that the grain of the tissue runs parallel to the longest dimension of the part. Use a single piece of tissue for each side of each assembly if possible. This will work for the tail and the bottom of the wing. The fuselage and top of the wing must be done in multiple pieces.

To cover the model, use lightweight tissue. If you have a source of silver tissue, use it, but, any color tissue or condenser paper will be OK because silver dope covers very well and can be put on without adding too much weight. The original airplane was finished with silver dope. This is actually aluminum powder suspended in clear dope and it dries to a semi-gloss silvery gray.

The adhesive of preference for covering models this size is thinned white glue. The top of the wing is covered with three pieces. Cover the center section first, and when the adhesive is dry, trim off all excess tissue.

Now cover the outboard panels, one at a time, in the following manner. Cut a piece of tissue about a quarter of an inch oversize on all sides except at the inboard end, where it should just overlap the centersection by about a sixteenth of an inch. Because of the dihedral angle, this root end of the tissue will be slightly curved. Make sure it has the correct curvature. Now apply the adhesive to the leading edge, the trailing edge, and the tip of the panel to be covered. Do not put adhesive on the tissue already covering the center section of the wing. Now carefully place the tissue on the panel so its root end just overlaps the rib at the center section. Stretch the tissue gently between the leading and trailing edge. Do not pull it too tightly or the unglued center overlap will be pulled down and off the rib. It should just lay smoothly all along the overlap. Smooth the tissue toward the tip making sure it has adhered to the edges continuously. Now, very lightly put a thin line of adhesive along the root rib overlap letting capillary action draw the adhesive under the joint. When dry, trim the tissue all around the edge with about a sixteenth of an inch excess, and then cement this down over the bottom tissue covering.

The fuselage needs to be covered with a piece of tissue for each side of the main fuselage frame, and a piece for the bottom, aft of the wing. If desired, all the sheet covering of the fuselage can also be covered with tissue.

When all the tissue covering is complete, it should be lightly sprayed with a fog of water and allowed to dry. (I use an old Mennen spray type deodorant plastic bottle as my water sprayer. It puts out a very fine mist which is shot across the top of the tissue and allowed to drift down onto the tissue.) As the water-fogged tissue dries, it will shrink taut.

A couple of coats of thin, clear dope should be brushed onto the model components, followed by a light sanding using 400 or 600 sandpaper to remove the fuzz raised by the drying dope. Sanding sealer can now be applied to the wood parts if desired. (This can add weight, so go easy.)

Now assemble the model. The bottom stringers should be tapered a little to fit the wing trailing edge. The vertical tail is cemented to the upper surface of the horizontal tail and then this assembly is cemented to the fuselage. Apply cement only at the leading edge of the tail. This will allow for adjustment to give some up elevator as was required by the model in the photos.

Bond paper wing fillets are cut out and folded to fit at the wing root-to-fuselage intersection. The Mite had simple, bent metal fillets (no compound curves), and thus are easy to model in this respect.

Now the entire model can be given a coat of aluminum dope. Then add all the details. Install the canopy. The windshield is a flat wrapped part, but the aft canopy has some double curvature and must be formed. Note: The author has flown a production Mite with only a windsheild installed, and it was legal to

fly the Mite with the canopy open . . . (slid back) . . . below 109 mph, so although he doesn't know if the prototype was ever flown that way, omitting the canopy doesn't appear to be too serious an omission.

With the exception of the gas cap on top of the turtle deck behind the canopy, which is red, all the other details are black. The wing lettering was done with commercial decals. The tail lettering and the control surface outlines were done with a thin black felt pen for writing on plastic. The retracted wheels and the anti-glare panel in front of the windshield is flat black paint. The black triangle on the bottom of the fuselage just aft of the rear motor peg, *isn't*. It is an open hole for seeing the rubber when installing the rear motor peg. It's dark inside a silver fuselage!

By the way, it's *supposed to be dark* under the silver dope. It is put on to give a surface finish impervious to the sun's rays and thereby delay the deterioration of the covering. Other colors are all more nearly translucent, which is why so many prototypes are flown with a simple aluminum dope color scheme. Everyone wants to fly as soon as possible, usually before a final color scheme has been decided upon. Besides, if modifications may be required because of flight testing, why take a chance of lousing up a super paint job.

A single loop of 3/32 rubber powers the model quite well. This gives a very rapid climb and is suitable for outdoor flying. Indoors, the motor should have a smaller cross-section . . . to keep the model out of the rafters.

Have fun with your Mooney Mite.

And finally, to put the record straight, the author of this model article did not have anything to do with the design of the original Mite . . . He did do 39 consecutive loops in N496M, one of the production aircraft some years back! ●