

At first glance the Mach 8 looks like any other pattern ship, but when you get closer, the size of the airplane has quite an impact. Unlike many other small airplanes, the Mach 8 is a very fast, groovy kind of ship. Several have been built and flown, and all of the pilots agree that it flies as good as, or better, than its big brothers. There are several "theories" about why the Mach 8 flies as well as it does, and this seems to be the one most unanimously agreed upon: Because of its light weight (4 lbs., 4 oz.) and high power (.40) we end up with a very good power/weight ratio. This, coupled with a light wing loading, gives the airplane the ability to "fly" through all of the maneuvers at a fairly constant speed with no zooming or ballooning. This

up three first, two seconds, and a third combined in Class B and C Novice Competition.

Unlike many aircraft published in magazines, the Mach 8 is not a "one of a kind" model. At last count there were twenty-three versions either under construction or being flown in Indiana, Ohio, Illinois, and Michigan.

The latest version of the Mach 8 incorporates a fiberglass fuselage. By eliminating the bulk of the balsa in the fuselage, it is possible to install retracts and still have somewhere to put a fuel tank! Needless to say, the installation of retracts and a Super Tigre .46 have enhanced the performance of the aircraft considerably.

For those modelers interested in the fiberglass version, the kit is being offered elsewhere in this issue.

So if you're looking for an economical way to go, but still want to stay competitive, what are you waiting for? The Mach 8 fills the bill, so let the balsa chips fly!

#### FUSELAGE:

The fuselage takes the most time to

lightweight wood with a uniform density when held up to a strong light. This will insure you of a uniform structural strength with no soft spots. After all, you wouldn't want your stabilizer to separate from the fuselage in the air, would you?

Once all the balsa has been selected, cut the sides to the outline shown on the plans, making sure to maintain the wing saddle and stab platform at 0-0. Next, cut doublers from 1/32" plywood and epoxy them to the fuselage sides from the firewall to the trailing edge of the wing saddle. Don't leave these out, as this lamination of balsa-epoxy-plywood furnishes 90% of the body's structural integrity. Next, cut the maple motor beams to the outline shown in the top view on the plans. The reason for this particular shape is that it retains the strength needed to hold the engine, yet allows plenty of room to get an 8-10 ounce fuel tank in the forward compartment. Epoxy the motor mounts in position on the fuselage sides. While this is curing, the triangular stock can be added along

BY JOE UTASI

# MACH VIII

**Twenty-three Mach 8's are currently flying the Midwestern Pattern circuit. This .40 powered competition machine is a very fast and groovy kind of ship. In fact, you'll find that Figure M's and Four Point Rolls aren't hard after all!**

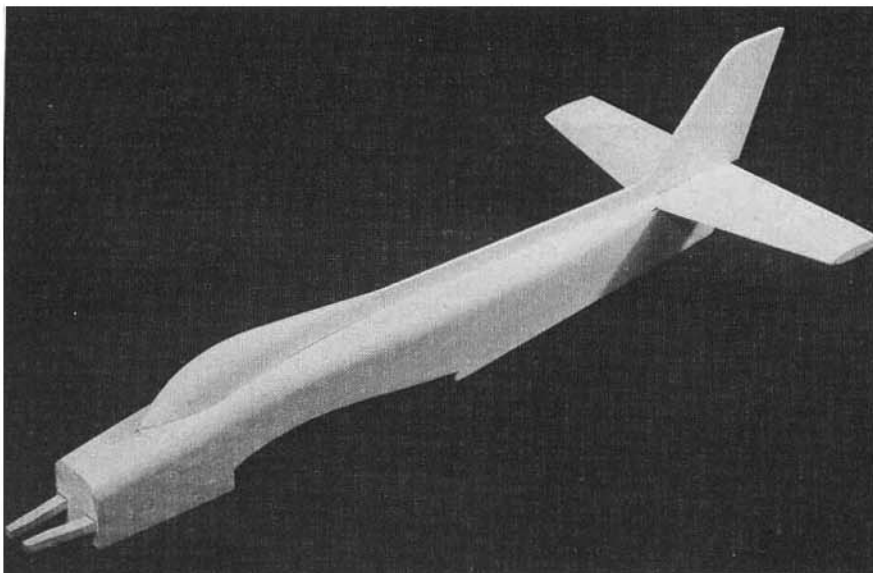
constant momentum makes the ship less susceptible to gusts and crosswinds, and also tends to make the maneuvers look smoother and more graceful.

During the Mach 8's first season of competition, it fared exceedingly well. At the Windy City's Cash Bash the ship bagged a second place, being only 13 points out of first place. Then, at the Wright Brothers Memorial in Dayton, the Mach 8 scored a landslide 1st place victory in Class B. Later, it garnered its third win in a row, a 1st place at Peoria, Illinois. Because of those three wins, the Mach 8 moved up to Class C Novice where it totaled

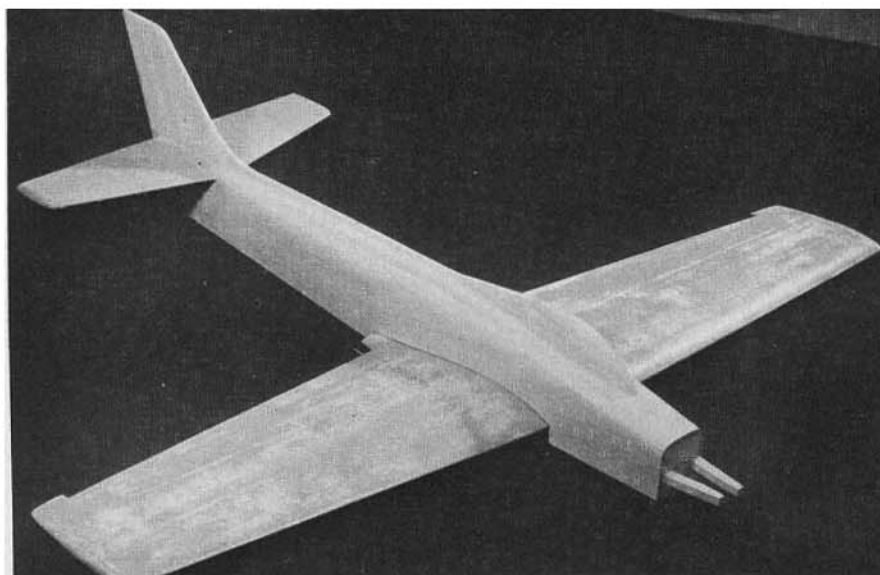


build, so I usually get it out of the way early. The first thing to do is select the wood. This is where modelers frequently go wrong. All balsa wood is not the same. Spend some time shopping around until you find some hard,

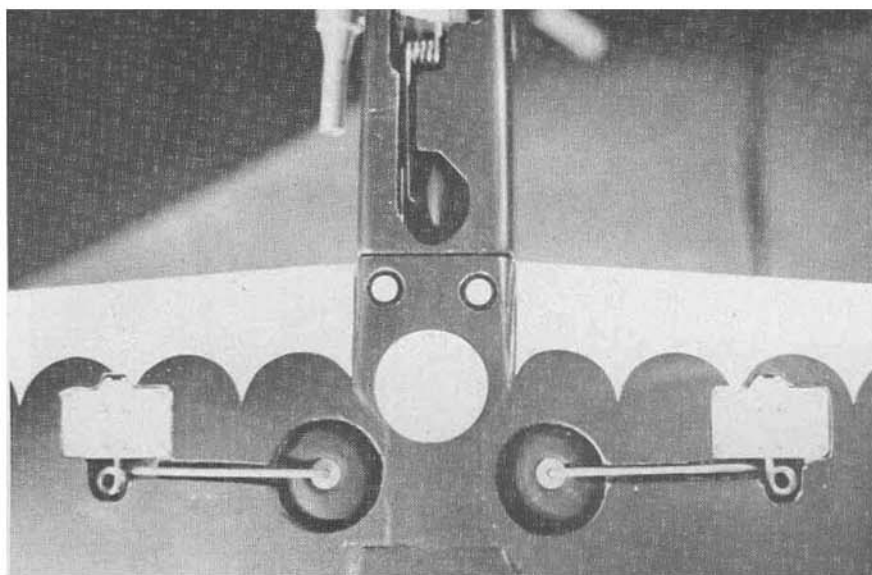
the edges of the fuselage sides. Set the sides away to dry and make your F2 and F4 bulkhead outlines on 1/8" ply, and the F1 firewall outline on 3/16" or 1/4" plywood. A jigsaw comes in handy here since it does a nice job in



The Mach 8 fuselage and empennage framework.



Here, the sheeted foam wing cores have been primed and sanded.



A retract gear version showing access hatch.

no time flat. When these are cut out, check fit them against the fuselage sides to make sure they fit properly. When you're satisfied that everything does fit, get your jig ready (if you have one) and assemble the sides and bulkheads in place. I use 5 minute epoxy here because I'm impatient. Don't pull the tail section together until you add F3 (hard 1/4" balsa). The space between F2 and F3 is for your receiver and varies from make to make, so first check your receiver size and put it where it's comfortable, but don't leave F3 out! This bulkhead retains the fuselage shape over the wing saddle when the tail section is pulled together. After installing F3, pull the tail together, making sure its absolutely true. When that all dries, add the 1/2" top blocks. At this point, the fuel tank, nosegear bracket, throttle and steering linkages should be added. Then plank the bottom of the fuselage, add the nose blocks and canopy, and carve liberally!

#### WING AND STAB:

Some of you may have doubts about the "sharp" leading edge that I use on the wing. Well, I've built and flown several now, both sharp and blunt, and I can see no difference at all in the performance of the aircraft. The big advantage to the pointed wing and stab leading edges is that the top and bottom wing coverings can be "lapped" over one another, thereby eliminating the need for any leading edge stock. This speeds the building process considerably and leaves more time for flying.

The wing and stab use foam cores which are then covered with 1/16" balsa sheeting. This results (usually) in a strong warp free wing. To begin with, you must make a set of templates from 1/16" plywood. These templates for the root and tip airfoils should be 1/16" smaller all around than shown on the plans since these include the wing skins. Next, using the top view on the plans, block out the outline for the wing and stab halves on some 2" foam. Fasten the templates to the root and tip with finishing nails, making sure to get the centerlines absolutely level, or else you'll be cutting a permanent warp into your wing!

The wing and stab can be sheeted with 6 sheets of 1/16" x 6" x 36" balsa which brings the cost to about 6 bucks. Cheap, huh? I'm not going to go too deep into how to cover your cores, but there is one point that cannot be stressed enough and that is

to sheet the cores in the blocks they were cut from. If you do it out of the blocks, it's very easy to distort the airfoil shape, and then you've really got problems. After you sheet the cores, glue them together with a good grade of epoxy glue and glass the center section. There's no need for any spars in the wing or stab. In a plane this size, the glass cloth is all that's necessary. Add the wing tips, block in the center section, add your linkages and your wing is finished.

#### **TAIL GROUP:**

Fasten the wing to the fuselage using your favorite method. Now, line up your stabilizer so it sets true on the fuselage, making sure the distance from the stab tip to the wing tip is equal on both sides. Now fasten it down with generous amounts of epoxy. Next, the fin is butt glued to the top of the stabilizer and the dorsal fin which runs back from the canopy is added.

#### **CONTROL SURFACES:**

Now that you've built yourself a very light, strong airplane, don't skimp on the control surfaces. They're small, so you can use good hard balsa, especially on the ailerons. By using hard balsa, the flutter which sometimes occurs during high speed runs can be eliminated. Also, don't cheat on the shaping — everything has a purpose, so stick to the size and shapes shown on the plans. A razor plane is an extremely helpful tool to have for this.

#### **FLYING:**

Now comes the best part. You've got your ship all finished and your travels set up as follows: Ailerons  $\frac{1}{4}$ " each way measured at the root; elevator  $\frac{3}{8}$ " each way; and rudder about 1" each way. On your take-off run give it full throttle and hold about 3 or 4 degrees back stick. When it reaches the right speed, it should lift off gently without the usual sharp "break." Climb out and split-S across the field and check your trims. If you've built it true, it should track straight ahead with no tendency to climb or dive. Turn it around and try some loops — don't forget to ease up on the stick at the tops to keep them round. If your engine is really honking, there should be no significant speed change either entering or recovering from the loops. Get up a good head of steam and try some rolls. If everything's set up right, only a very slight forward pressure will be required in the inverted position. By now you'll have the hang of flying it and the rest should all fall into place. Soon, you'll discover that 4-point rolls and Figure M's aren't that hard after all! Pretty soon, when people rib you about your "little" airplane, you'll be able to point to your trophies and shut them right up!

Good flying . . .

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