

#862

P-51 MUSTANG

■ Steve Kerry

Graphic Design by Jill Ann Cavanaugh



Ready to go. Author cautions about orientation when flying a chrome aircraft against a low sun!

Photos by the author

Scale wing and tail areas contribute to overall realism of the P-51: "I've never cared much for 'wannabe' Scale models."



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ASK THE AVERAGE power flier, and they will tell you that Scale models take a long time to build, are heavy and difficult to fly, are only brought out when the weather is perfect, and of course, they cost a lot of money. Ask the same average flier about Electric power, and they will talk about heavy, underpowered, very fragile aircraft that fly so slowly they can hardly get out of their own way.

So when you tell them you're building a Scale P-51 Mustang that is powered by a little Speed 400 motor and can be flown like a sport model, they'll probably laugh at you—until you fly it.

I've never cared much for "wannabe" Scale models. You know the sort of thing: a guy takes an Ugly Stick and paints a camouflage pattern on the wings, adds a couple of roundels, and calls it a semi-scale Spitfire. Yuk! I'm a sport flier, not a rivet-counter, but if a subject can be modeled accurately and still fly well, then I don't see the point in simplifying it.

When I decided to build a series of Electric warbirds for Speed 400 power, I wanted to see if it was practical to build accurate models that would still be suitable for sport flying. The Mustang is the first of that series to be completed.

A quick bit of math showed that a 1/12-scale model (32-inch span) would have more wing area than a Speed 400 pylon racer, and a target weight of 17 ounces would give good performance on seven cells.

I like the little Speed 400 motors; they have their limitations, but if you stay within those limitations you can have a lot of fun.

This is not an airplane for beginners, but if you have flown a low-wing design before, then you will have no trouble here. The Mustang will not survive repeated crashes as a trainer would, although most damage can be repaired without too much drama (a tree jumped out in front of me once and removed half the wing, but the airplane was flying again the next day).

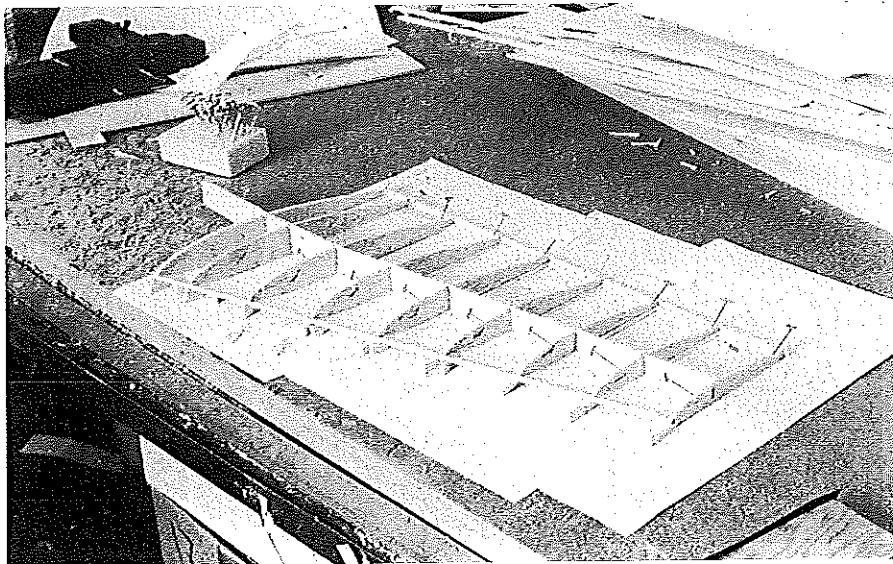
All horns and pushrods on the prototype are internal, but if you want to hang them out in the breeze, I'm sure it will still work. Looks pretty ugly, though.

I assume you already have your favorite method of radio installation, and can place the various components to achieve the correct Center of Gravity (CG). The most important thing is that you select your wood with care and build accurately; there is no point trying to fill a bad joint by pouring in extra glue.

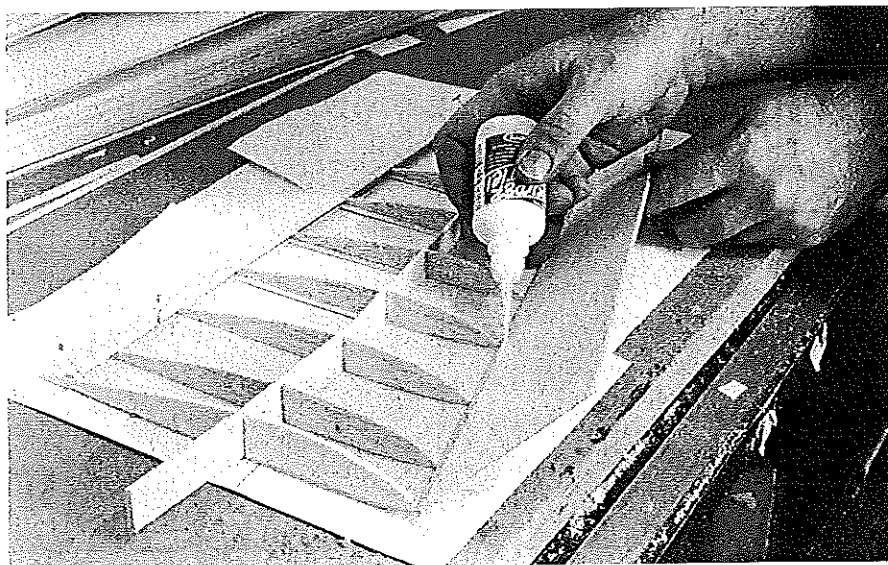
CONSTRUCTION

Wing: The photos of the P-51 wing construction were accidentally destroyed by the photo lab. Some of the photos in this article show the wing building sequence for a different airplane, using identical construction.

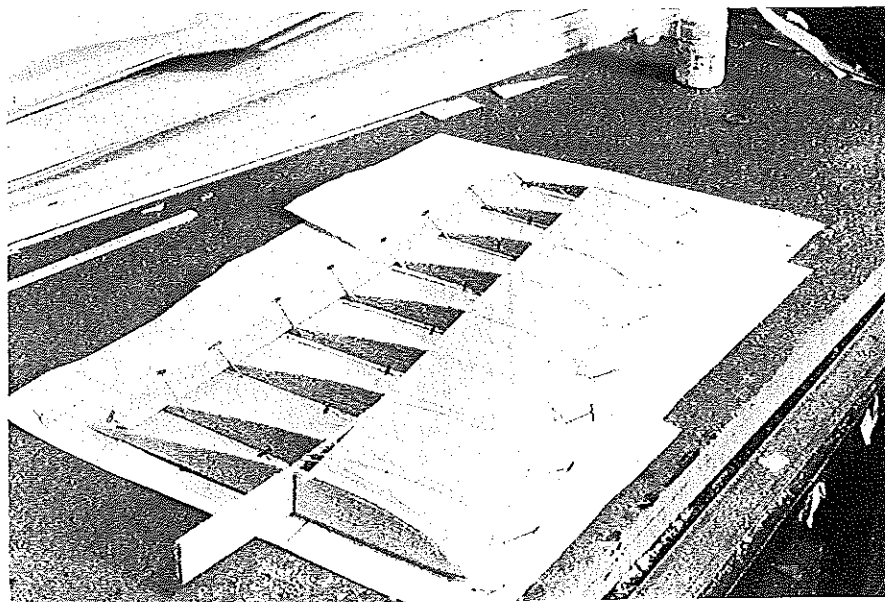
The wing construction is a little different from that found in most kits. There are no spars; the webbing connects



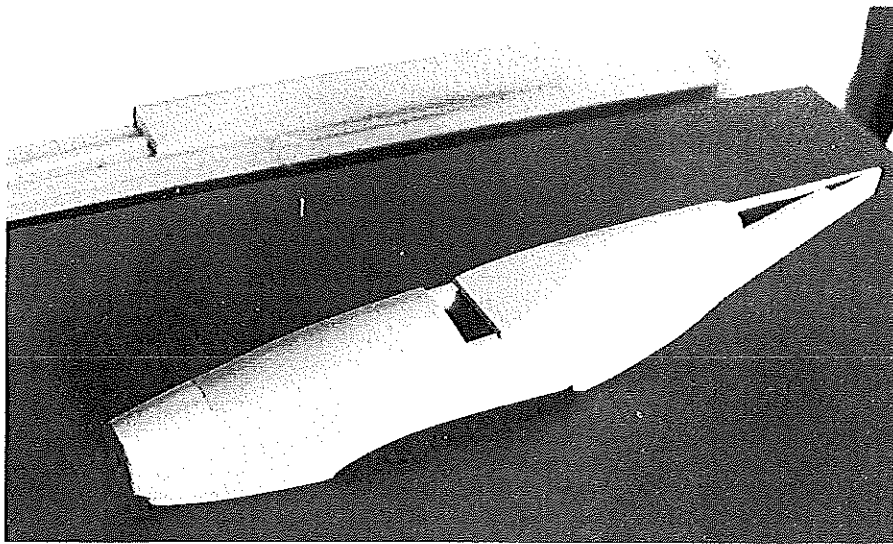
Scrap balsa wedges raise lower sheeting so LE dowel aligns with front of ribs.



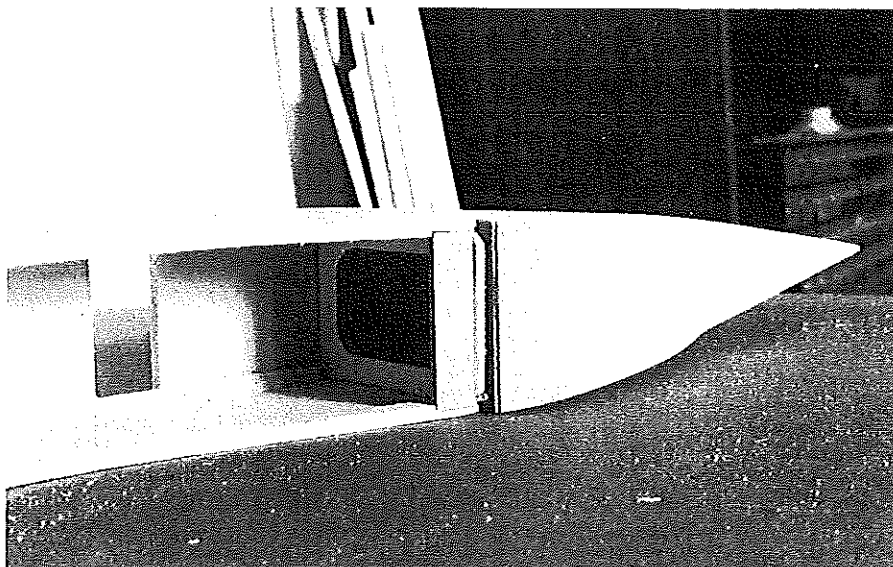
Add glue to ribs and webbing, fold top sheeting over, hold with pins and rubber bands.



Scrap piece keeps bands from gouging top sheet. Keep wing pinned flat to board.



The fuselage is a basic box; top decking and rear of the scoop are blue foam.



Looking into wing cavity. Blue foam/balsa is ideal combination for Electrics.



Type: RC Scale

Wingspan: 32 inches

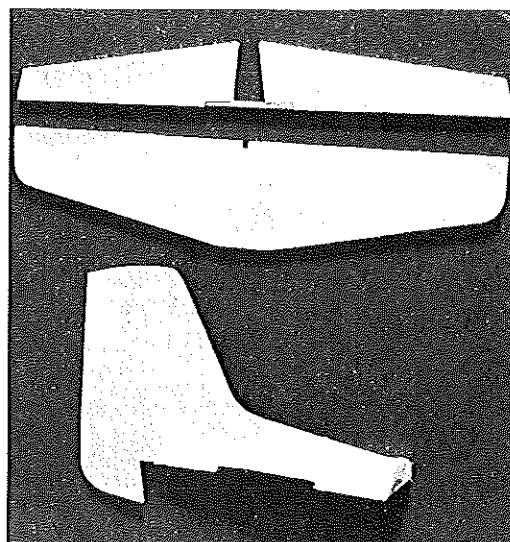
Motor Speed: 400

Functions: Rudder, elevator, aileron

Flying Weight: 20 ounces

Construction: Built-up

Covering/finish: Solarfilm™



Tail feathers are made from $\frac{1}{8}$ sheet. Blue foam fairings at the base of the fin would be better if made from balsa.

directly to the top and bottom sheeting and is quite strong for a wing of this size. Thinner or longer wings may need a strip of hard balsa incorporated into the sheeting where it meets the webbing, but spruce is not necessary and carbon fiber would be complete overkill.

The entire wing is made from $\frac{1}{16}$ sheet, with the exception of the LE ($\frac{1}{8}$ dowel) and the dihedral brace ($\frac{3}{32}$ hard balsa). Be sure you use very hard $\frac{1}{16}$ strips for the TE; the prototype only used medium balsa and had to be strengthened later as a result. Note the center-section sheeting on the plan tapers out to R5; the prototype did not have this feature, and a stress riser occurred at the aileron root.

Start construction by cutting a 45° angle down one side of the LE sheeting. You can get a cheap bevel cutter from any art supplier; they are used to cut mat boards for picture frames. I used a Logan cutter.

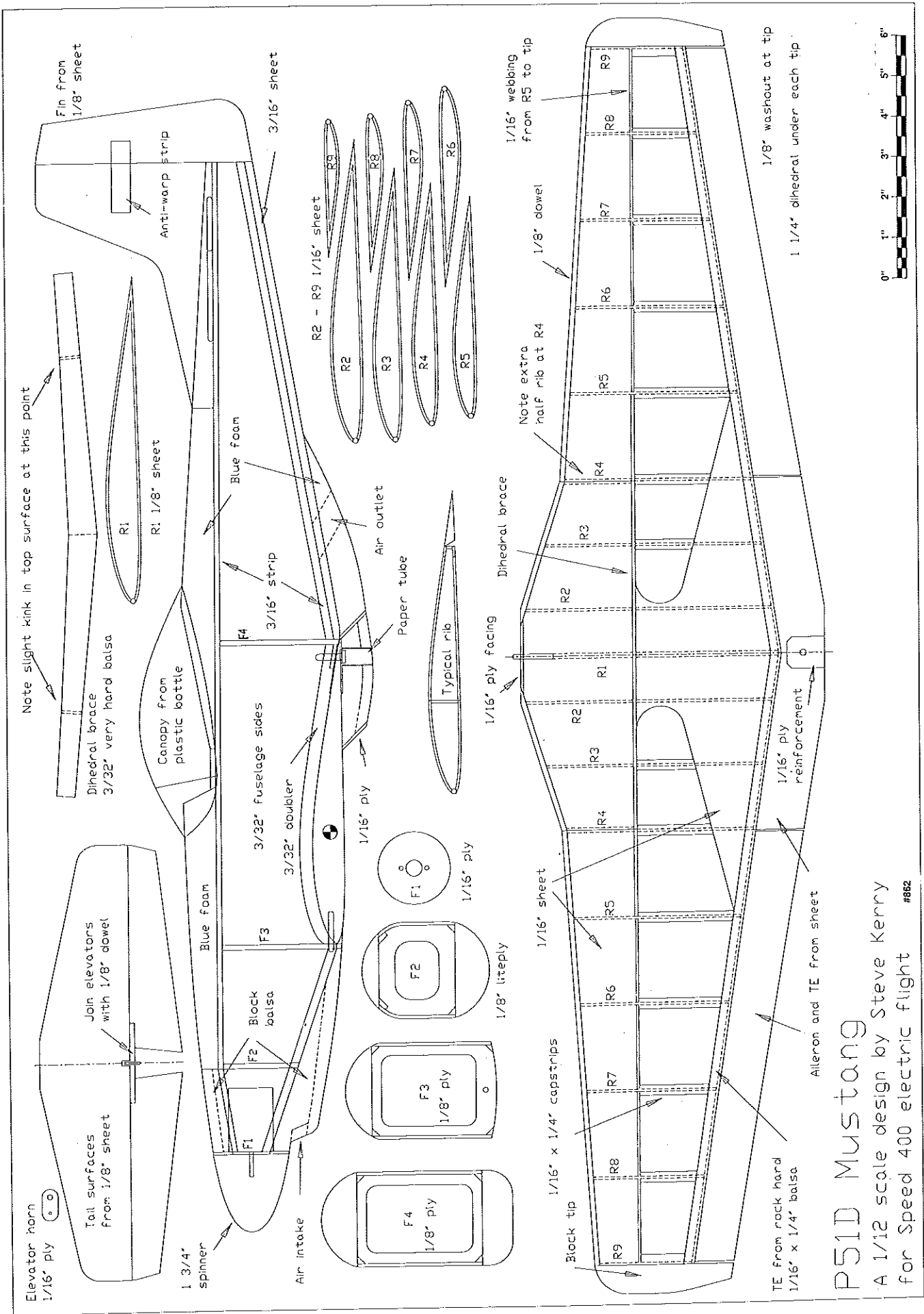
Put your straightedge on the LE sheet, run this handy little gadget down the side, and you have a perfect bevel. Cut two sheets this way, glue the $\frac{1}{8}$ dowel to one of them, and let it dry.

Lay all the bottom sheeting on the plan and pin it down, including the lower LE sheeting with the attached dowel. Pin the LE sheeting at the rear edge only. Because of the kinked wing, you will have to use two pieces of LE sheet for each panel.

Glue everything together and add the ribs; check the position of each rib by lifting the LE dowel and sliding the rib forward to meet it. Glue the rear half of each rib in place, remembering the double rib at R4 and the dihedral angle on R1.

When everything is dry, pack up the LE with small triangles of scrap balsa and glue it to the ribs. Be sure that the rear of each rib is flat on the board. When this is dry, cut a slot in ribs R1-R4 and install the dihedral brace. Because the wing taper changes at R4, the top edge of the brace is not a straight line; if you cut it straight, this will show at R5 and create a weak point. Use more $\frac{1}{16}$ sheet to add the vertical webbing; this extends from the dihedral brace to the wingtip and should be a snug fit—cut carefully! When dry, sand down any high spots on the webbing so it fits flush with the top of the ribs. Add a strip of hard $\frac{1}{16}$ sheet along the TE, cutting the ribs back to suit.

Take the other piece of LE sheeting and lay it on the wing, sliding it forward so the beveled edge sits snugly on the dowel. Cut to size and tape it to the LE dowel, then fold it forward like a hinge and run glue along the joint. Add glue to the ribs and webbing, and fold the LE sheeting down into place.



P51D Mustang

A 1/12 scale design by Steve Kerry
for Speed 400 electric flight #882



will be the first part to contact the ground when landing.

Screw the wing in place and sand the scoop smooth. When the airplane is assembled, the joint should be virtually invisible. You will need to make a paper tube slightly larger than the wing bolt head to fit inside the scoop and guide the wing bolt into place.

Cut an air outlet into the back of the scoop; the full-scale Mustang had a radiator flap here, but I cut a nonscale hole and painted it black. When I put the invasion stripes on the lower fuselage, I made sure the outlet was lined up with a black stripe, and it is almost impossible to see.

Covering: I covered the prototype with chrome Solarfilm™, which was adequate but not brilliant for this application; polished aluminium Fibafilm would be a better alternative.

The ailerons were taped in place and the top of each wing was covered in a single piece. Then the ailerons were flipped back over the wing, and the underside covered with another piece that stopped just short of the torque rod. The paper tube was then glued firmly to the aileron—check that the surface does not bind—then the last bit of the aileron is covered. If you are adding invasion stripes (highly recommended for visibility), this

part of the aileron will be under a stripe anyway.

If you have never flown a chrome model before, watch out for orientation problems.

Pick a flashy color scheme for your Mustang—the brighter the better! Normally I test-fly my models with just basic blocks of color, and only add details after they have been proven in the air (an advantage of Electric flight; you can't do that with a slimy glow engine). The Mustang is an exception.

I chose a red nose and rudder, with invasion stripes on wing and lower fuselage. Stars-and-bars were added from plastic film, along with registration letters and a black panel on the nose.

The canopy is made from a plastic bottle, formed over a blue foam plug. This is quick and easy, and the price is right! The curvature was quite steep, and I had to make the canopy in front and rear sections and glue in place. Please install a pilot—the cockpit is highly visible and it looks pretty silly flying around with nobody at home.

My target weight of 17 ounces was a little optimistic. The prototype ended up weighing 20 ounces, but if I built another, I'm pretty sure I could manage 18 ounces.

Flying: Balance the model where shown for the first couple of flights, and adjust

the control throws to 1/8 inch all around. My first flight had the ailerons at twice this movement; it was a wild ride!

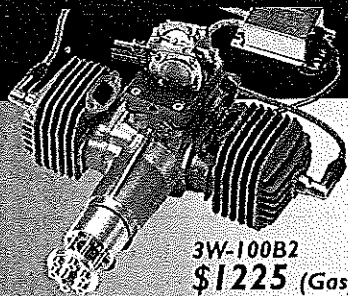
The air scoop makes a convenient handgrip for launching. Throw it like a javelin, straight and smooth. Give it a couple of seconds to get up speed, then pull into a climbing turn and watch the sunlight flash off those wings.

Keep it close until you are familiar with the airplane—these little models can get very small in a short amount of time.

The Mustang will go wherever you point it. Low passes are particularly impressive. With the power off, the glide is everything you would expect from such a clean design. Stalls are gentle and straight, provided you built the wing accurately in the first place. The prototype can be slowed down to almost walking pace for landing. If you have a sealed surface at your flying site, you might even install a set of Robart's mini retracts!

I hope this has convinced you to try one of these little models. The cost-to-fun ratio is unbeatable, and if you start now, you can be flying it next week! →

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