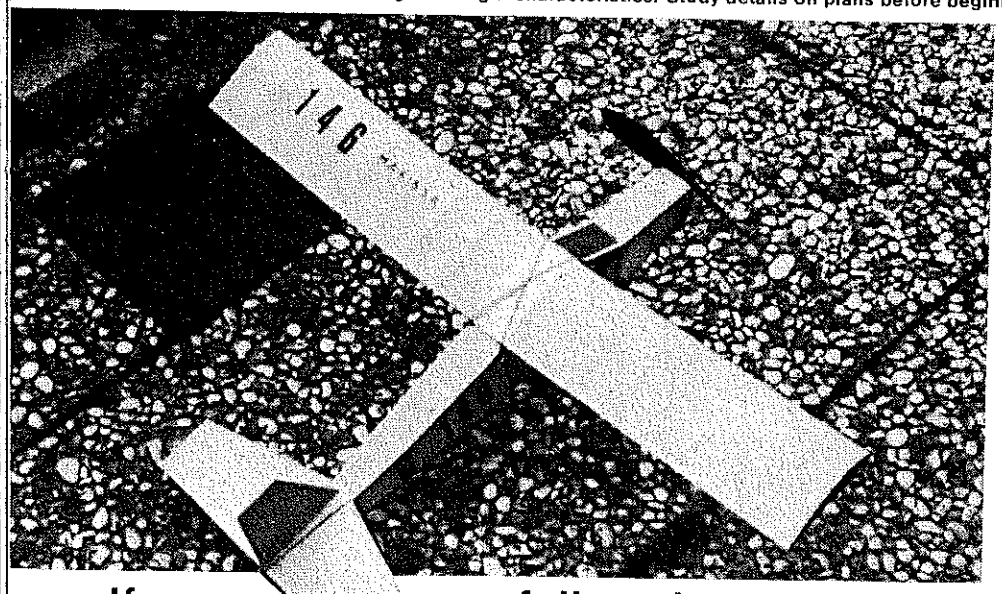
#374

Marissa

J. van Hattum

Two Marissas—the model, and the author's daughter who lent her name to the airplane. The model is ideal for beginners—simple construction techniques, easy adjustment, and gentle flight characteristics. Study details on plans before beginning construction.



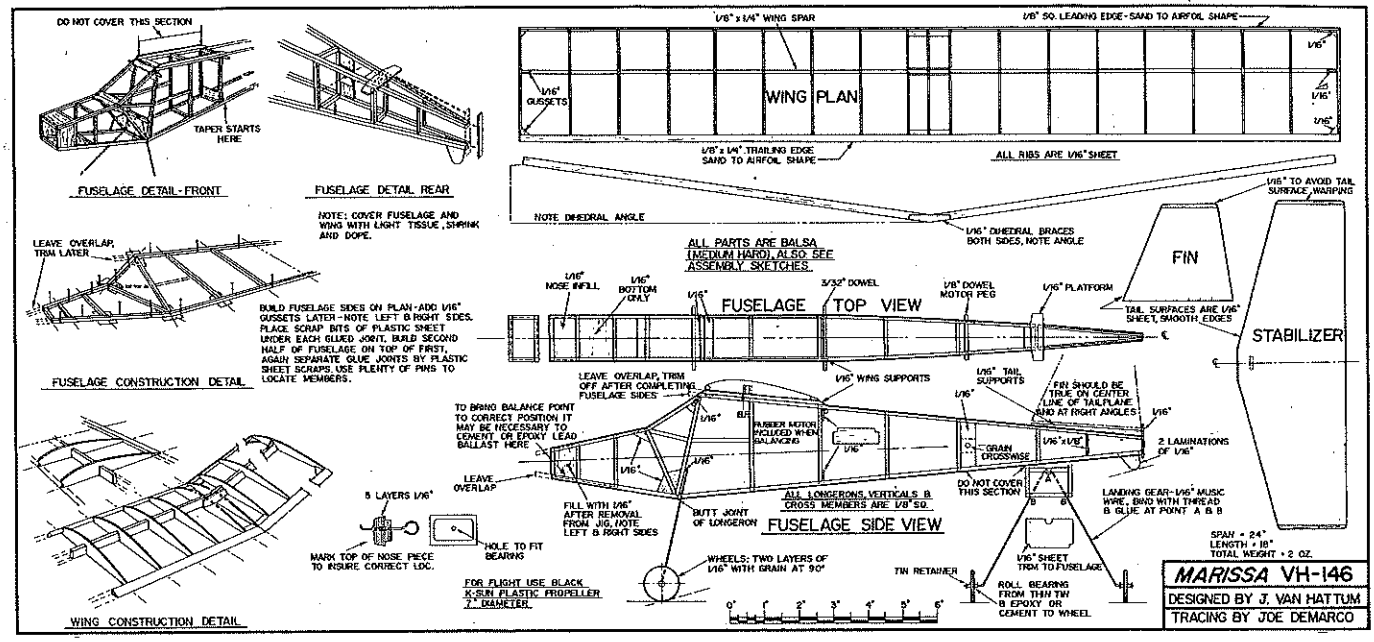
WHEN YOU HAVE been designing models for longer than you care to remember, you tend toward ever-greater simplicity. There are plenty of highly sophisticated contest designs, but the simple model which may help young builders to climb the ladder of fame is a rare bird. This writer set himself the task of producing a model that looks attractive and can easily be adjusted and flown by builders who may only have built a chuck glider. It needs more attention to detail, but for many the actual building can be just as much fun as that first tense moment when they see the product of their hands take to the air.

Marissa incorporates nothing new. It is based on time-honored basic principles. It might, in fact, have been designed many years ago. Rubber power is as old as aeromodeling, and that great gift from nature, balsa, has been with us a long time.

Pay attention to the basics, like proper location of the center of gravity. The prototype needed a touch of lead ballast in the nose.

If you can follow simple instructions, you can build and fly this pretty little FF Rubber job. It builds fast, trims easily, and flies in a way that'll bring joy to young or old.

FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 164



The plan and sketches should really be all you need to make the model, but some notes might still be welcome. Try to visualize the construction in all details before you take up the knife. Proper planning of the model is important.

I prefer to work on a soft composition board, which is quite flat and which easily takes the numerous pins used to keep the parts in place. It is also cheap and can be replaced when worn. Few tools are needed for building this model. The most important are a sharp knife and steel ruler for cutting straight, some fine sandpaper to smooth off rough edges, maybe a small file for rough work, a pair of pliers to bend piano wire, strong thread for binding the undercarriage to the fuselage, and a box of large straight pins (steel mapping pins will also do well). After years of using transparent cement, I have switched to white woodworking glue, preferably of the waterproof type. It takes a little longer to set firmly, but it will often be possible to switch to another part of the job while the first part is drying. White glue becomes almost invisible and leaves no rough edges, but excess glue should be carefully removed at once.

Fuselage. You will note that the fuselage shows no curved members, except for the gentle taper towards the stem. The lower longeron has a simple butt joint at the junction with the undercarriage. Reason: a curved lower contour induces a built-in stress in the structure, unless the longeron has been moistened and pre-bent in a jig (and this makes the work more complicated).

Build the fuselage's sides on the plan, first locating the outline and trimming the vertical members to size and angle. Where joints are glued, place small bits of polyethelene (cut from plastic bags) so nothing will stick to the building board. Use plenty of pins so members will not shift. When it has all set, assemble the other side on top of the first one, again using pieces of plastic to keep them separate. After removal, fit the various 1/16 gussets, etc., noting that the sides are left- and right-handed.

Assemble the two sides using the 1/16 cross members, taking care that a true rectangle is formed (and one side does not project in front of the other). This is the only somewhat tricky operation on the fuselage, so care and patience are essential. The former which is to take the undercarriage may also help to obtain a firm and true structure. Now work forward installing the cross members, sheet fill-ins, etc. The tapered aft section should be true and in symmetry with the center line before the extreme tail is glued, after which the cross members and other details are added. You will now have a nice fuselage, but do not cover it yet; you may want to take a picture of the completed structure!

Undercarriage. A little practice in bending piano wire might be useful if this is the first time you've done it. See to it that the undercarriage is symmetrical. You can fix it to the fuselage by binding as indicated or by using epoxy glue, but test it for strength. The model only weighs about 1¾ oz. complete, so the landing gear won't have to take large loads. The wheels are made of two layers of balsa sheet, grain crosswise. The plan gives all details.

Tail surfaces. If you want an easy job, this is it. Just cut the stabilizer and fin from the sheet and join them, but take good care to see that the fin is true on the center line and at right angles to the stabilizer.

Wing. When you have built the parts already described, you should have enough experience that the wing will not be a difficult job. Remember that the wing is the essential part of every model; all the other parts are just passengers carried by that wing.

First assemble the wing main spar, which is split in the center and re-joined by the dihedral braces which determine the angle between the two halves. This dihedral (or open 'V' form) ensures lateral stability; that is, the wing will return to a level attitude when it has been disturbed by a gust, etc. This is a Free Flight model, so automatic stability has to be built into it—hence dihedral and tail surfaces.

Very lightly mark the position of the ribs on the spar; it will facilitate work later. You might also prepare the plan to work on or copy it on a separate sheet. Remember there is a left and right side, and that is why we make up the main spar first. In the heat of battle I once produced two identical halves!

Making the ribs is sometimes seen as a tedious chore, but it is a necessary one. To obtain a fair approximation of the chosen airfoil, the rib

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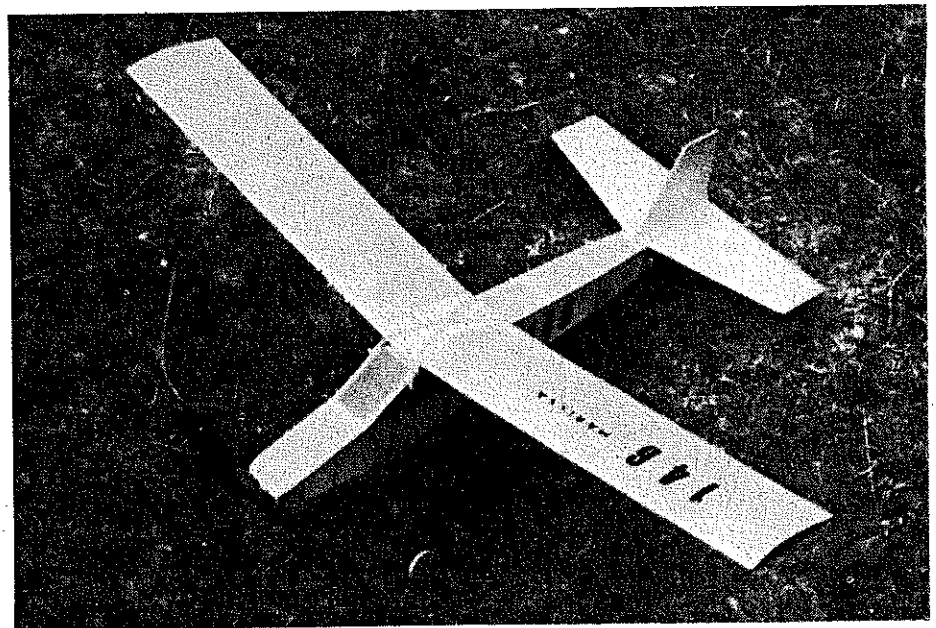

Marissa is based on time-honored principles to guarantee success to the tyro builder. It needs no expensive parts or materials. If you've built any models at all, you'll have no trouble.

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spacing should not be too great, so Marissa has no less than 19 ribs.

One way to make accurate ribs is to make a thin three-ply template. First, trace the template onto the sheet (grouping the rib shapes as efficiently as possible). Second, cut out ribs with a sharp knife (never cut inside the traced rib shape). When you cut at an angle to the grain of the balsa, always choose the direction which will tend to make the knife stay outside the contour. In the case of the ribs, that would be from the highest point towards the front and the rear. Sand the ribs to the correct shape by lightly clamping them to the template. Carefully mark the slots for leading edge and main spar, and cut them out so they slide with some friction on the spar. Throw away ribs that have oversized slots! Finally, cut off the rear of the ribs where the trailing edge will be.

Locate the main spar on the plans with pins, and glue the ribs at right angles. When the joint has set, add the trailing edge and then the leading edge, leaving some excess length at the center section. This will be trimmed to join up with the members of the other half of the wing. The last thing to do will be the fitting of the center rib (wide slot!), reinforcements, and gussets. Inspect the wing for rough spots, etc., and sand smooth.

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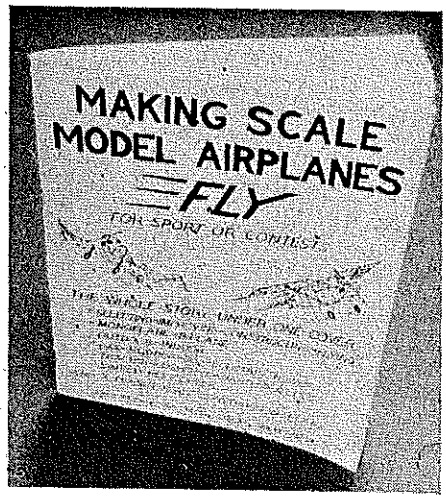

Making Scale Model Airplanes Fly, by Bill McCombs, $7.95 ppd. from Aircraft Data, Box 32021, Dallas, TX 75224.

That title really says it all. If you are even remotely interested in any kind of FF Scale model, from Peanut to Gas, here's the straight word on why they do what they do. It's written in an easily-read style, and organized to put the data in front of you with a minimum of searching. There are even chapters on unusual things like pushers, canards, flying wings and helicopters. The beginner will save himself a lot of effort by buying and reading this book. There's lots there for the expert as well. To top it all off, there are three plans for Peanut Scale models in the back of the book. What more do you want? This should be an essential part of a modeling library. As the publisher suggests, it would make an excellent award for last place at a flying contest.

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Nose block. The plan shows that it is built up of layers of 1/16 sheet. It should fit snugly inside the fuselage. A hole provides a fairly tight fit for the bearing supplied with the 7-in. Kaysun propeller.

Covering. Tissue covering is almost a lost art these days, but with care and patience you will master it. Start with the fuselage. The sides are each covered in one piece, so trace the shape with a generous overlap all around. I prefer to stick tissue to a framework with white office paste, but others prefer a 50-50 mix of dope and thinner. Stick tissue to the nose first. Let it dry, and stick it to the tail end, pulling it fairly tightly. Some tissue is stronger in one direction than the other; always take the stronger side lengthwise and spanwise. Trim the outside, leaving enough overlap to stick the tissue around the longerons. After this, the covering of the top and bottom will be simple. Note where sections should be left open. The one at the rear is to give access to the motor peg.

The wing is best started by covering the bottom, which is flat. When covering the top of the wing, fix the tissue to the highest point of the center and tip rib, stretching the tissue as usual. Next, stick it to corners at leading and trailing edges. Finally, finish off the entire contour with a moderate pull chordwise (parallel to the ribs).

The covering is shrunk by spraying it lightly with water, then finished using clear dope thinned 50-50. Choose a large, soft brush for doping, and start with the bottom surface. The tissue will sag alarmingly, but end up tight as a drum. While the top surface is still moist, pin down the wing to keep it flat. Some builders like to finish one wing half before doing the other. Finally, brighten up the model with whatever decals you like. Don't forget to stick a small label on each part with your name, address and telephone number. You may have one long flight and lose it; identification will help in getting it back.

Trimming and flying. Thoroughly inspect your model for proper alignment: wing and tail true when viewed from the front, and fin dead on the center line. Rubberbands stretched from peg to peg hold down the wing, and a crosswise rubberband slid over the fuselage and anchored at the stern post fixes the tail unit.

Carefully inspect the wing for any twist. This can be corrected with another coat of dope, or by steaming the wing, twisting it in the opposite direction and holding it for a time.

Make up the rubber motor into four strands (using a square knot) some three to four inches longer than the distance between the prop hook and the rear motor peg. To avoid bunching the rubber after unwinding, the motor can be plaited: make it into two strands, and wind one half the 'wrong' way; then double it, and it will twine together much shortened but capable of the same number of turns.

Lubricate the rubber motor with castor oil, rolling it between your hands to ensure it has reached every strand. Hook the motor over the prop shaft, tie a thread with a small weight at the other end, drop it through the fuselage, pull the thread and rubber motor through the rear opening, remove the thread, and slip the rubber over the peg.

Balance the complete model on your fingertips at the correct point shown on the plan. My model dropped its tail, so it balanced too far back, and the center of gravity had to be brought forward by adding lead ballast to the nose. When this has been done, you are ready for the first test flight.

Although my model proved quite capable of flying in a strong wind, it was buffeted about a lot. Since it is so light it did itself no damage. However, when it is blown head-over-heels along a hard surface, something may well get broken. Choose a quiet day with little wind, and fly over grass—not too near houses and trees which cause turbulence.

With that relatively big prop the glide is not impressive, so give the motor some 30 turns and launch Marissa straight into the wind. Watch its behavior closely. An interested helper, preferably another modeler, will be a great help.

Our model required a tiny bit of side-thrust. A strip of heavy paper was slipped behind the nose

block to the right. No downthrust was needed, as this has been built into the design.

Gradually build up the turns until you reach 350 to 400, which is the maximum safe limit. The turns can be increased when the rubber is stretched with the helper holding it firmly at the nose, his hand loosely around the rubber so he can catch it if it should break. A burst motor can do a lot of damage to the covering!

If the model should climb too steeply after a gentle start from your hand, shim up the front of the tail with a sliver of balsa or paper, adding more as necessary. Should it descend steeply, shim up the trailing edge of the tail. Do not expect flights longer than 30 to 40 seconds, for that is all that it has been designed for. It will rise-off-ground from a smooth patch quite nicely, and it is fun to see the tail come up and the gentle climb. It is very docile.

Much help was given by the late Glen Sigafoose, who sent propellers and rubber to power a hundred Marissas. Bob Peck of Peck-Polymers and Frank Zaic also contributed to the project.

FF Duration/Meuser

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rearward, allowing it to engage in a hole in the nose block. (This is beginning to sound about as exciting as a patent application.) Also after winding, the locking pin (left side of Roger's drawing) is pushed into the hole in the nose block, and the prop is allowed to rotate with the torque until the pin locks. To release the locking pin, the flier rotates the prop against the torque, allowing the spring to push the pin out.

The spring, wire, and tubing sizes have been carefully worked out, and can probably be adapted to the hub of your choice if Roger's entire design is a bit beyond your shop facilities. Note that the forward hole for the locking pin is 3/32 diameter and the rearward one is 1/16. For the stop pin, the hole sizes are reversed.

Easy-does-it engine starter. I received the following note from Charles McCutcheon: "Back when I was working on the Glowdriver I had my introduction to electric starters. I was amazed that people would use anything so brutal on delicate models. If the starter is well-aligned with the engine, operation is smooth, but if alignment is bad, the starter thrashes around and tries to tear the engine out of the airplane! I fitted a starter with a ¼-in. diameter aligning pin, and I drilled a ¼-in. hole in the end of the spinner (see sketch). The alignment then took care of itself, and operation was always very smooth. If the spinner were shaped thus (alternative spinner in sketch), the aligning pin would more easily find the hole. I doubt if it would increase the drag much."

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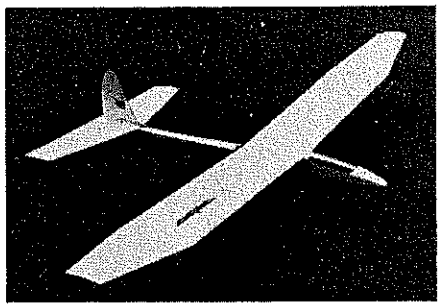

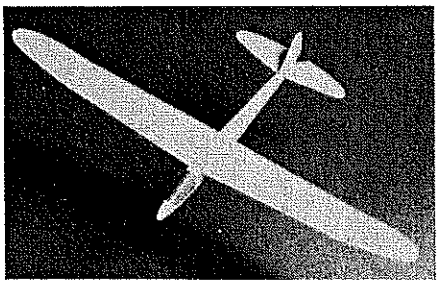

Soarer and Lazy Bird Sailplanes, from Midwest Products Co., 400 S. Indiana St., Hobart, IN 46432.

Here are two interesting new models for the glider fans among us. The Soarer is a Two-Meter design that offers some interesting aerodynamics. It is an all-wood kit, featuring a bolt-on wing and tail and simple, efficient spoilers. Fuse sides are one-piece light ply for duability. Soarer can be flown with two or three channels. it is a flown with two or three channels. It is a deluxe kit, complete with vac-formed clear canopy, tow hook, rudder and elevator pushrods, and spoiler actuators. Retail price is $44.95. For the less ambitious, or those who want to get out and fly, Midwest's latest all-foam critter is called Lazy Bird. The first-time builder will like the easy assembly, bolt-on wing reinforced with top-and-bottom spars, spacious fuse with plywood spine, and built-in towhook and skid. The experienced pilot will appreciate the flight characteristics; it's said to fly just as well as any wooden model. Thorough step-by-step instructions are included. Lazy Bird will have merit as a beginner's kit, since Sailplanes are generally easier to fly than powered planes, especially if you don't have expert help. Lazy Bird requires a two-channel radio, and retails for $59.95.

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