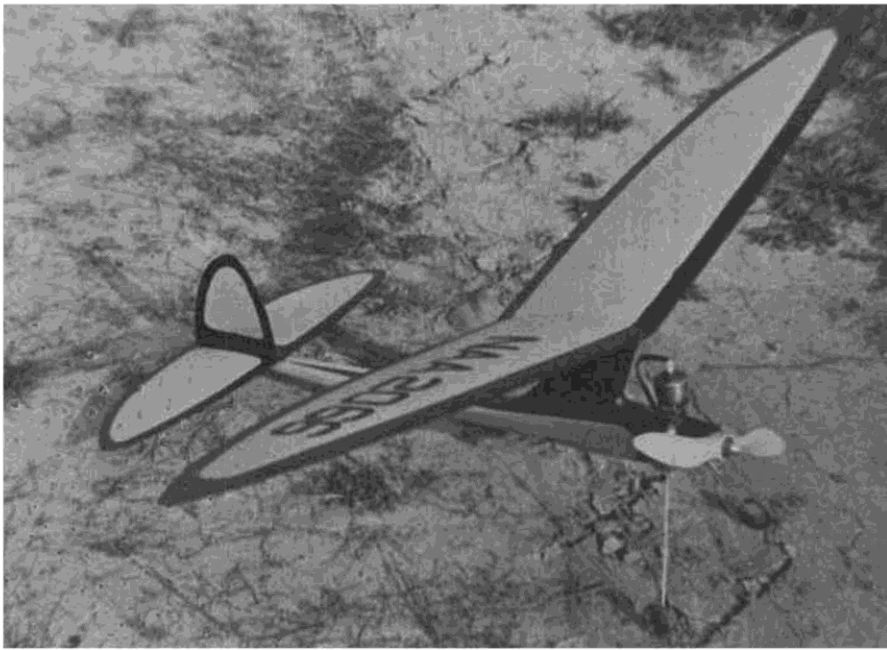




Tom tilts the model so you can see the graceful elliptical curves in wing and stab.

TOM LAURIE'S.....

• All Balsa Gas Model •

This time, as explained in the text, we have a complete construction article for The OLD TIMER of the MONTH. Better late than never!

"Dear Mr. Laurie:

Thank you for resubmitting your "All Balsa Gas Model" article.

We still would like to publish this, but due to unforeseen circumstances, we still have a quantity of material on hand.

We are returning this therefore, and if you would care to send it to us again in about 3-4 months, we will endeavor to accept it then.

Very truly yours,
Charles H. Grant
Editor"

(The above letter was mailed on Dec. 22, 1939, but somehow, Tom never got around to returning the material for another try at having it published. Recently, it turned up while he was rummaging through some memorabilia, still in the brown manila envelope, with five 3-cent stamps for First Class mailing from New York to Ft. Wayne, Indiana, Tom's home at the time.

Never being one to completely give up, Tom, who now lives in Newport Beach, California, brought the complete article, as originally submitted to Charlie Grant, then editor of Model Airplane News, to our office, and said, "It's just a little outdated, but maybe you'd like to publish it."

So, here it is, only 37-1/2 years later. We've printed the article without any updating or modification (except for italicized comments). John "Daddy

Warbucks" Pond has put his O.T. blessings on the design, based on the clearly dated envelope that contained the original article material. wcn)

The small gas model presented here is an efficient model for the smaller line of gas engines. The design, having been influenced by the indoor variety of models, is very stable. The model has a tight spiral climb and a very flat glide. I believe it will make a very formidable entry for the coming contest season. The outstanding feature of the model

is the all-balsa construction of the wing and tail assembly. This type construction may sound difficult, but it is not.

The little ship is very simple, but a careful study of the drawings and instructions will be very helpful. The extra time required for making a full size drawing will be more than compensated for during the building of the model. The drawings are very easily made since the ones in the magazine are already half size (Well, not this time, but we've done the full-size drawing for you. wcn)

Perhaps something should be said about motors at this point. I used a "Baby Cyclone" in my model, but any of the smaller motors will be satisfactory. The weight is a fraction over one pound, so any of the 5/8th motors will be able to fly her. The installation of other

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Here's Tom (a little younger, but not much thinner than he is today, the lucky bum!), holding his all sheet balsa gas model in launching attitude. Span is 48 inches.

motors requires very little change in construction.

FUSELAGE

Select two pieces of very hard 1/4 x 1/2 balsa (or spruce) for the main longerons. Splice on the 3/8 x 1/2 motor mounts. Place the three cross pieces of longeron material and pull the stern together (*Note: fuselage may have to be wider to suite your engine. wcn*) Taper the underneath of the longerons as seen from the side-view and then cover the rear section with 1/16 sheet balsa. See section C-C for clearness.

The next step is the landing gear. The main member is 3/32 steel wire. After it is bent to shape, it is bound to the longerons with thread and glue. File a couple of nicks in the wire so the thread will have something to hold to. The rear member is made from 1/16th steel wire, and it is formed after it is bound in place to the longerons. Bind the two landing gear members together with soft wire and solder. I used hard wood wheels; but I would suggest air wheels for ordinary flying and test flying. The airwheels lower the center of resistance and thereby steepen the glide. Two brass washers soldered on each side of the wheels hold them in place.

Next drill four holes in the motor mounts and mount the motor. Now let us proceed with the ignition as shown on the drawings. I used a "General" 3-volt battery as shown on the drawings. I have found these batteries very successful. The ease with which the ignition wires can be attached and the mounting of the battery itself make this type battery very desirable. Drill a 1/16 hole in each contact and solder an eyelet on the end of each ignition wire and attach to battery with two small bolts and nuts. This makes changing batteries at the airport very easy. The battery fits between the longerons snugly as shown on the drawings. I used a dural timer of the extended arm type. Attach four pieces of dural 1/4 x 3/8 to each corner bolt of the timer. Insert the timer between the longerons and place a small wood screw in each of the dural tabs. The coil and condenser are strapped in place and the ignition is complete.

Select a piece of balsa 2 (or wider) x 4-3/4 x 9-1/4 inches for the wing mount or pylon. Carefully lay out the side-view and cut to shape. A band-saw will simplify your work a great deal. Now lay out the front-view as shown in section A-A and cut to shape. The bottom is left as it is. Top of the pylon is shaped as shown by the dotted line in the top view. Now cut a template for the dihedral angle from stiff cardboard. Cut the dihedral angle in the top of the pylon or wing mount, checking carefully with the cardboard template. This is probably the most difficult and important step in shaping the mount. The strength of the wing depends on

the joint you make at this point. Now cut to streamline shape as shown in section B-B. Sand carefully and hollow out as shown by the dotted lines. Now glue former "D" in place and then glue the pylon in place on the longerons.

There are three other parts to the cowl, the first piece fits around the motor and completes the upper cowl. It is just spot-glued in place. The lower cowl is in two pieces, the rear portion is removable and it is held in place with transparent sticky tape. The front section is cut to shape and hollowed out and glued in place. Former "E" is now cut from 1/16 plywood and glued in place.

Sand the whole fuselage assembly and give it four coats of dope. Rub each coat in with your fingers and sand between coats. The fuselage is now complete.

WING

Select a piece of white pine or similar soft wood 1 x 8-1/2 x 25. Shape this board to the McBride section. This can best be done by first cutting a cardboard template to the McBride section. Lay this section off on each end of the board. Now plane off the excess and sand very smooth. The accuracy with which you shape this board will determine the closeness your wing will conform to the McBride Section. (*Another, and easier way to build this jig was explained in Ron Roberti's "Volare" A/2 article in our April '77 issue, or Fernando Ramos' "F/F Scale" article in our January '77 issue. wcn*).

The wing is constructed from quarter grained (or the best you can get) balsa. This wood should be about 6 lbs. per cu. ft. in weight, but if it is unobtainable, use the lightest balsa you can obtain. A small block plane is a very handy tool in shaping the wing. Two pieces of balsa 1/4 x 3 x 24 are required for the wing. Eight inch wide balsa is hard to procure, so you will probably have to glue two pieces together. This is easy to do, but it requires some very careful workmanship. After straightening the two edges to be joined, apply plenty of glue and rub together. Now place the wood on a straight or flat board to dry. Some heavy weights will come in handy in holding the wood down while it is drying. Now lay out the shape of the wing and cut both halves at once. Shape the leading and trailing edges and taper the whole wing towards the tip. Sand the entire wing with several grades of sandpaper. Now take one half of the wing and place it top down in a pan of hot water. Let it soak for a few minutes and then place it on the wing form. Wrap the wing to the form with 1/2 inch wide gauze and place in an oven to bake. I would advise leaving the wing on the form for about ten hours after removing from the oven. After removing the gauze, sand the upraised grain while the wing is still on the form. Next, remove the wing from the form and glue

the two ribs in place "immediately". Dope three times, rubbing each coat in with your fingers and sanding between each coat. The other half of the wing is completed in the same manner.

Block each tip up 5 inches and sand the center edges so a perfect joint may be obtained. Cement the two halves together and hold in place with pins. Give this joint several coats of glue, being very careful to keep the blocks under the tips all during this operation. The glue should extend outward for a distance of about one inch. The wing is now complete.

STABILIZER AND RUDDER

A piece of balsa 1/8 x 5 x 20 is required for the stabilizer. The stabilizer is made in the same manner as the wing, and on the same form. The position of the stabilizer on the form is shown on the plan.

The fin is made from a piece of 3/32 balsa. Carefully round the leading edge and taper the trailing edge to a point at the rear. The movable portion of the fin may now be cut and hinged with two small pieces of aluminum. Carefully shape the bottom edge of the fin to the shape of the upper curve of the stabilizer and glue in place. Two pieces of 1/8 balsa (soft) may be glued on each side of the fin, where it joins the stab and later sanded to form a filet.

ASSEMBLY

The success of the model depends upon the accuracy with which you assemble it. The stabilizer and rudder are first glued in place on the fuselage. The lower fin or skid is now glued in place. It is made from the same material as the rudder. Now give the wing a thick coat of glue and place it on the pylon: Several pins will help hold the wing in place while it is drying. Again may I say "check the wing for alignment", because the model is fast and any "mis-alignment" will really show up when you fly it. (*Some 2 inch wide gauze around the joint should add reassuring strength. wcn*).

The gas tank shown in the drawings is for a "Baby Cyclone" engine. It is soldered up from .008 shim brass. The 5/32 tube slips on over the intake tube, thus affording an ample gas supply for the straight-up flying the model does. A piece of 1/8 inch wide sheet brass fastened under one of the motor lug bolts and soldered to the tank holds it in place.

The propeller is shown on the drawings full size. It is carved from gumwood and has about 3/32 undercamber. I recommend the following of this design very closely.

The model is now complete except for painting. All-balsa construction lends itself very nice for finishing. After you have painted the model, give it a couple

of coats of Simoniz. You are now ready for a test-hop.

Select a field with some nice deep weeds for test-hopping the little ship. After gliding the model several times to determine whether she is balanced o/k, I would advise hand launching of the model on its first few flights. My model had a tendency to stall when the circle was enlarged. I did not use any off-set in the thrust line. My model circled with the torque both under power and in the glide. Well fellows, I hope you have as much fun with your model as I had with mine. ●