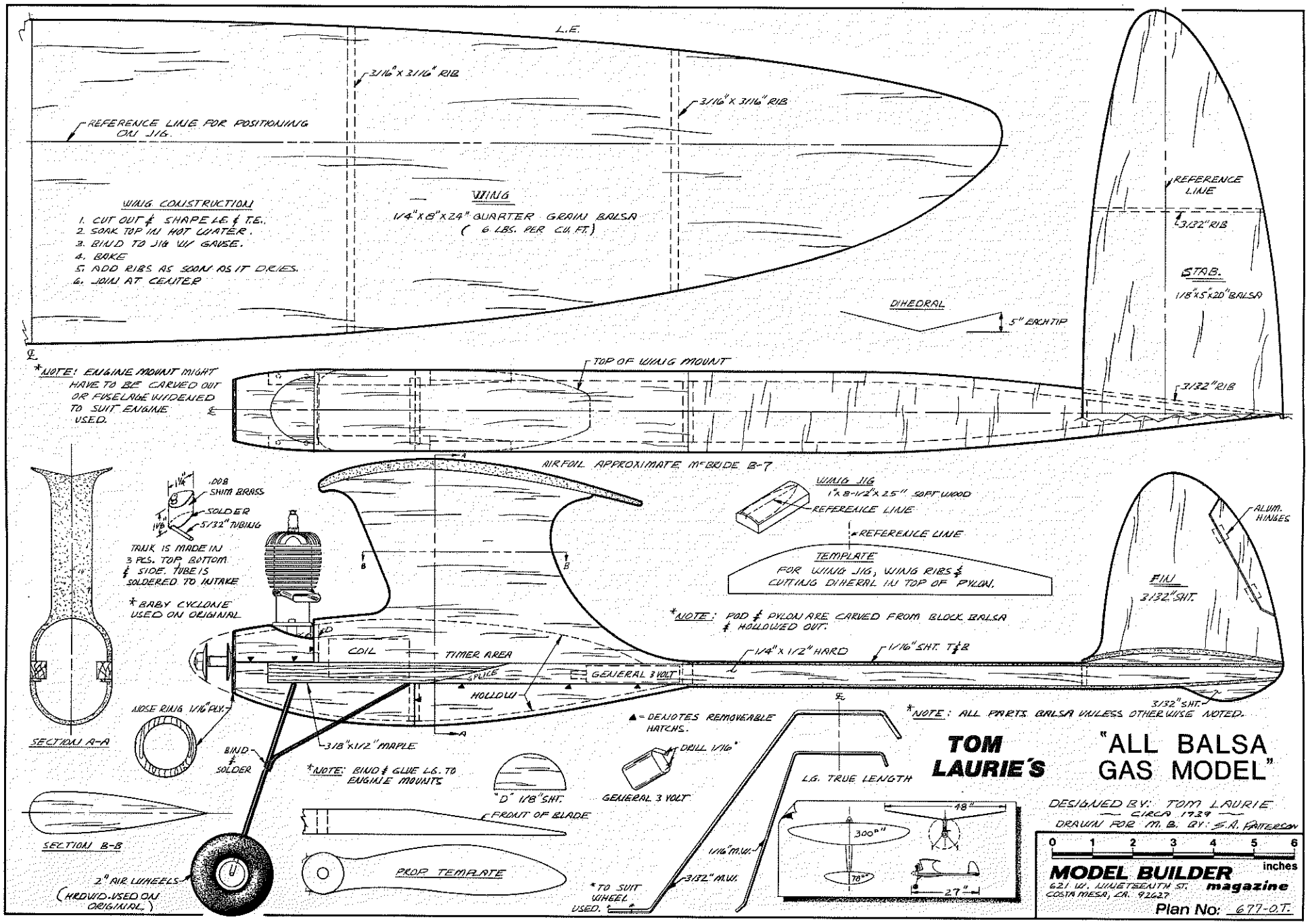
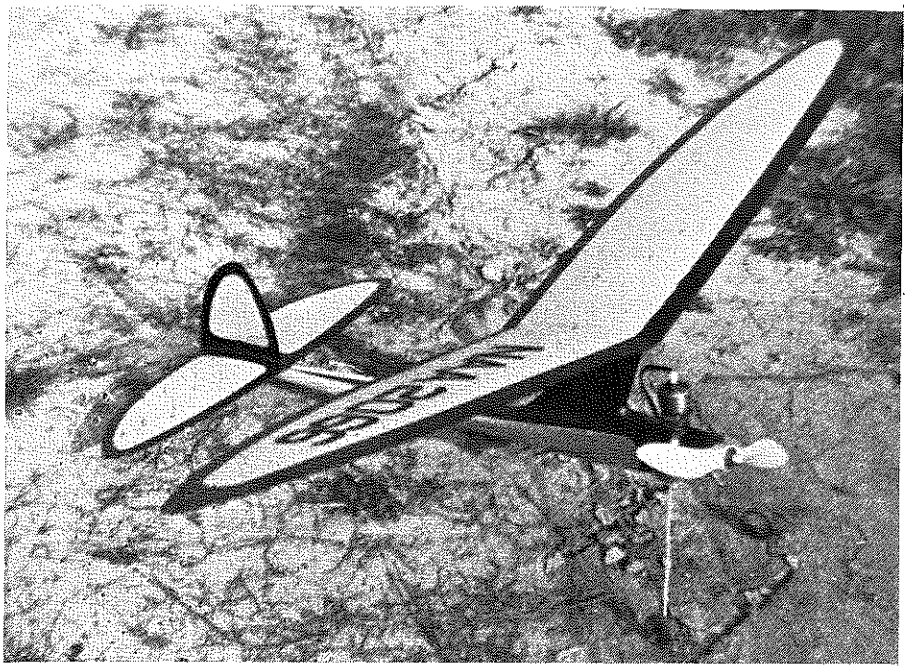

L.E.
3/16" x 3/16" RIB
3/16" x 3/16" RIB
REFERENCE LINE FOR POSITIONING ON JIG.
WING CONSTRUCTION
1. CUT OUT & SHAPE L.E. & T.E.
2. SOAK TOP IN HOT WATER.
3. BIND TO JIG W/ GAUSE.
4. BAKE
5. ADD RIBS AS SOON AS IT DRIES.
6. JOIN AT CENTER
WING
1/4" x 8" x 24" QUARTER GRAIN BALSA
(6 LBS. PER CU. FT.)
DIHEDRAL
5" EACH TIP
REFERENCE LINE
3/32" RIB
STAB.
1/8" x 5" x 20" BALSA
3/32" RIB
*NOTE! ENGINE MOUNT MIGHT HAVE TO BE CARVED OUT OR FUSELAGE WIDENED TO SUIT ENGINE USED.
TOP OF WING MOUNT
AIRFOIL APPROXIMATE McBRIDE B-7
.008 SHIM BRASS
SOLDER
5/32" TUBING
TANK IS MADE IN 3 PCS. TOP BOTTOM & SIDE. TUBE IS SOLDERED TO INTAKE
* BABY CYCLONE USED ON ORIGINAL
WING JIG
1" x 8-1/2" x 25" SOFT WOOD
REFERENCE LINE
REFERENCE LINE
TEMPLATE
FOR WING JIG, WING RIBS & CUTTING DIHERAL IN TOP OF PYLON.
*NOTE: POD & PYLON ARE CARVED FROM BLOCK BALSA & HOLLOWED OUT.
ALUM. HINGES
FIN
3/32" SHT.
COIL
TIMER AREA
SPLICE
HOLLOW
GENERAL 3 VOLT
1/4" x 1/2" HARD
1/16" SHT. T & B
3/32" S.HT.
*NOTE: ALL PARTS BALSA UNLESS OTHERWISE NOTED.
SECTION A-A
NOSE RING 1/16" PLY
BIND & SOLDER
3/8" x 1/2" MAPLE
*NOTE: BIND & GLUE L.G. TO ENGINE MOUNTS
▲ = DENOTES REMOVEABLE HATCHS.
DRILL 1/16"
GENERAL 3 VOLT
"D" 1/8" SHT.
FRONT OF BLADE
PROP TEMPLATE
SECTION B-B
2" AIR WHEELS (HRD/WD. USED ON ORIGINAL)
*TO SUIT WHEEL USED.
1/16" M.W.
3/32" M.W.
L.G. TRUE LENGTH
48"
30.0"
78°
27"
TOM LAURIE'S
"ALL BALSA GAS MODEL"
DESIGNED BY: TOM LAURIE
— CIRCA 1939 —
DRAWN FOR M.B. BY: E.A. FATTERSON
0 1 2 3 4 5 6 inches
MODEL BUILDER magazine
621 W. MINETEENTH ST.
COSTA MESA, CA. 92627
Plan No: 677-O.T.



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

Continued on page 91

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.

two main cabane struts. Rather than tie knots in the rigging, I just fed the thread through a pair of holes and then hung clothespin weights on the loose ends to keep the thread tight. A small drop of glue or epoxy will attach the thread to the inside of the strut, and when dry, the thread is cut on the outside of the strut and another small drop of glue used to seal the hole. Make up and install the lift struts, attaching them with 5-minute epoxy. Thin, flat, silver grey enamel can be used to cover all the bamboo.

Check the model to make sure that the wing is parallel (or at a slight angle) to the top fuselage longerons, and that the stabilizer has about 1/32 negative incidence (leading edge lower than trailing edge). The wing, stabilizer and fin should be steamed free from warps, although 1/32 washout can be steamed into each wing panel for some beneficial effects.

Check the balance point, which should be about 1/3 of the way back from the leading edge of the wing. My model required a bit of clay at the tail to offset the weight of the large prop. Try a few test glides and some low-powered flights. Start with 50 or 60 hand winds and observe the effects. Shim the noseblock with some punch-card stock, as needed. Some slight warping of the stabilizer and/or fin may be needed for fine trim.

When you see the Meteor flying with it's exposed cylinders, and the pilot able to see and be seen, perhaps you'll agree that the 30's was indeed part of aviation's Golden Age.

By the way, the fin and stabilizer areas have not been altered, with a bit of additional dihedral and the flying prop being the only deviations from scale. ●

Old Timer .... *Continued from page 33*

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 cowling, the first piece fits around the motor and completes the upper cowling. 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 "misalignment" 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. •

Half-A ..... *Continued from page 59*

design with twin vertical tails. The fuselage is very smooth and has been gel-coated, so preparation for finish is minimal. The wings are custom cut foam cores over which is laid leading edge planking and cap strip ribs. The airfoil is not quite fully symmetrical, but close enough so that inverted and outside maneuvers are as good as insides. Wing tips and vertical tails are die-cut, all other parts are sawn. Aileron links, elevator horn, and nylon wing hold-down hardware are included. I have seen a Laser fly, and it is smooth, maneuverable, and really fast. I have heard that it is even being raced competitively.

ACE "Mach None": This is the sister ship to the one that started it all, ACE's "Pacer". The Mach None represents an improvement in several areas, however. The most important item is the addition of an 1/8 square spruce spar to the center portion of the wing. My Pacer's wing was visibly "mushy" after a year of flying (and a few crashes). Second, a single-wheel landing gear has been added to the design. This cushions the landing significantly, for those with hard runways. Third, the carved canopy of the Pacer is replaced by a two-piece vacuum-formed canopy and turtle deck. These moldings are of unusually high quality. Of course, both kits feature tapered ACE foam wings, all saw-cut wood parts (very accurate and neatly done, too), and some hardware. I had an immense amount of fun with my Pacer, and expect the Mach None to give even more entertainment. Just as a side note, I flew my Pacer with a muffled Tee Dee .049 on 15% nitro fuel most of the time. It would still do a nice vertical roll from level flight. High nitro, a bored venturi and pressurized fuel should be mind boggeling.

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