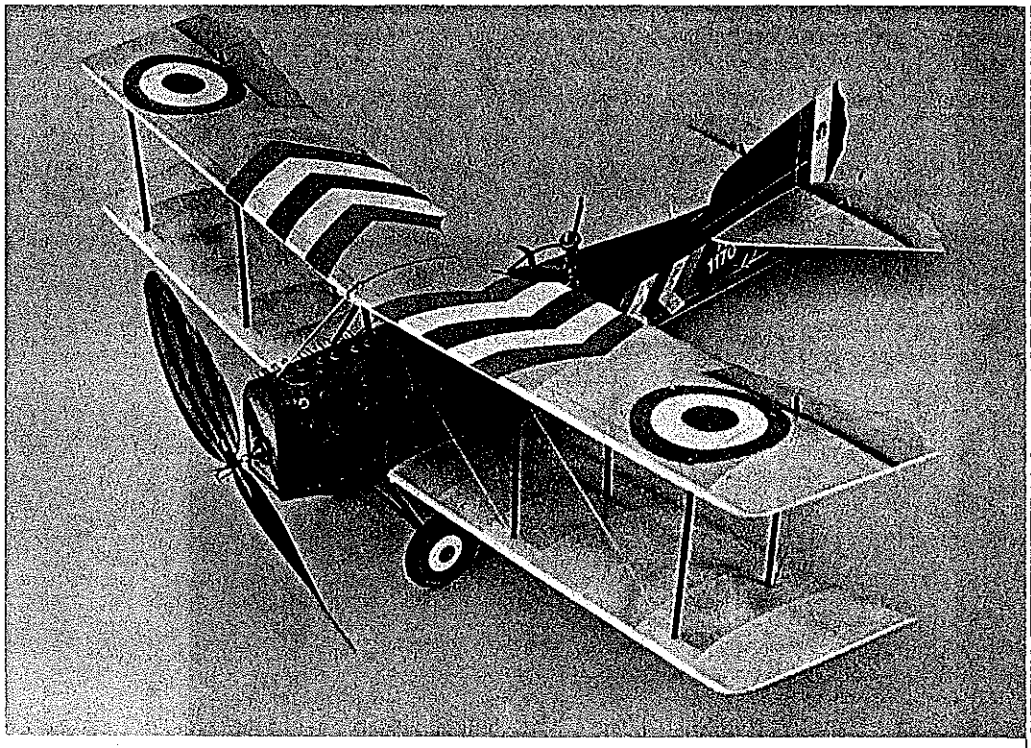
If rubber-powered Scale models with character appeal to you, this WW I Italian reconnaissance aircraft may be the one you're looking for. With 31-in. wingspan (scale of 13/16 equals 1 ft.), it fits into what is generally called the Jumbo category.



Proportions of the Pomilio are nice for Rubber Scale, though the tail surfaces have been slightly enlarged for the sake of improved stability. Wings are washed-out at the tips, as well.

Bill Noonan

Pomilio PE

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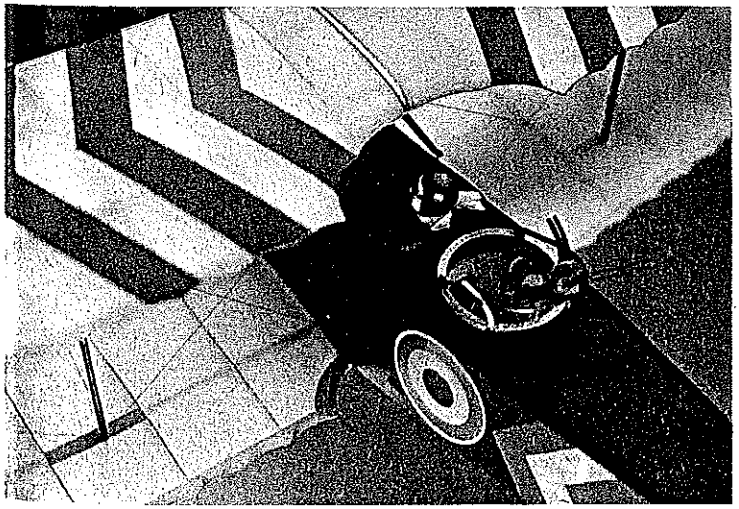
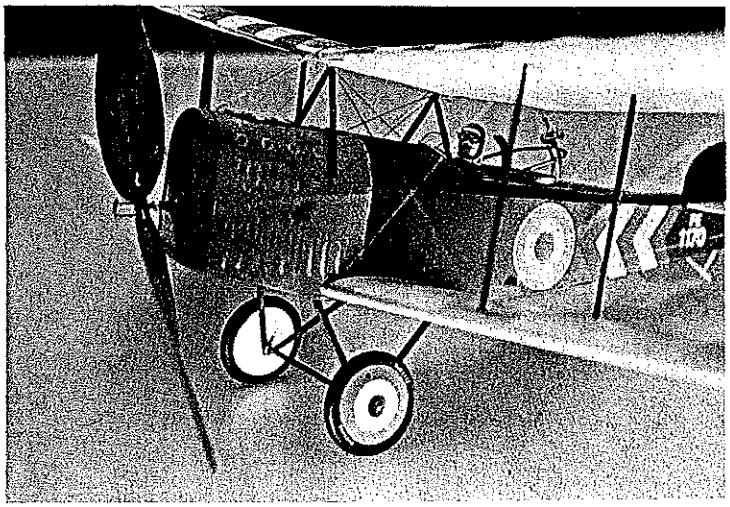
Fuselage construction. We are in the habit of laminating fuselage longerons. The ones in the Pomilio are made by cementing 1/8 x 1/32 balsa to 1/16 sq. to form an L-shaped piece. (See the enlarged detail on the plans.) This kind of longeron allows the tissue covering to be cemented along the edge of the 1/32 balsa, never touching the fuselage upright structure. You may wish to substitute 1/32 sq. balsa, which simplifies construction.

Lay the longerons over the side view of the plans, and cement in the upright parts. Make a right and a left side. If you use the laminated longeron, cut 1/32 sheet balsa plates at the nose, and set them in flush with each side. Use 3/32 sheet at the nose if you use the alternate longeron method.

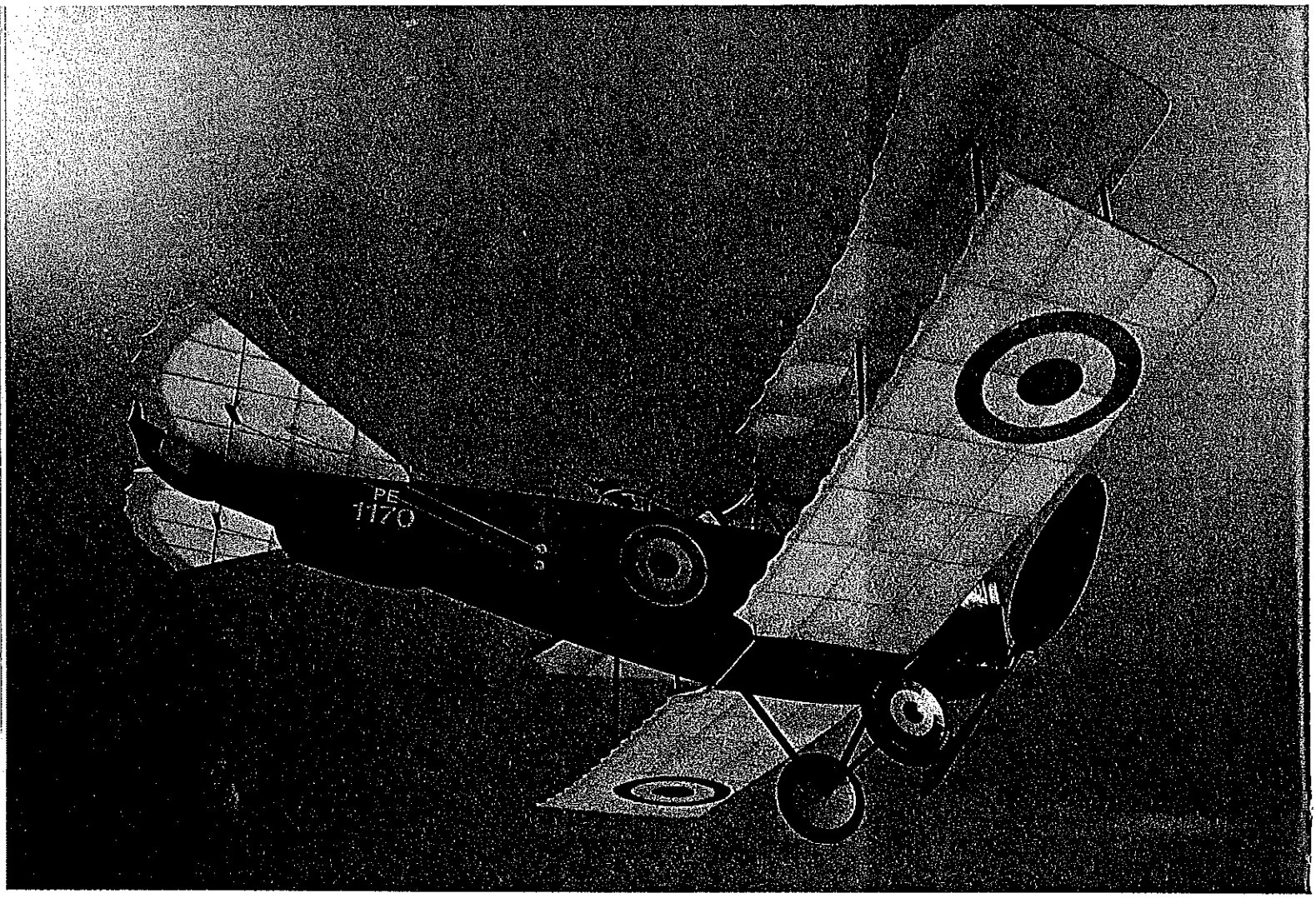
Note that the two uprights that provide for a 1/16-in.-dia. aluminum tube rubber anchor at the tail are to be made of hard 1/16 balsa. It is well to back this up with a 1/64 plywood doubler. Rampant rubber is very unforgiving to the fuselage interior!

After the cement is thoroughly dry, invert both frames, and align them over the top view of the plans. Cement the tail posts together, and work your way forward by cementing the crosspieces in place in their respective stations. Check the fuselage for symmetry as you go. It will be necessary to clamp the nose together during this operation, as the widest part of the fuselage is in the cockpit area. A pile

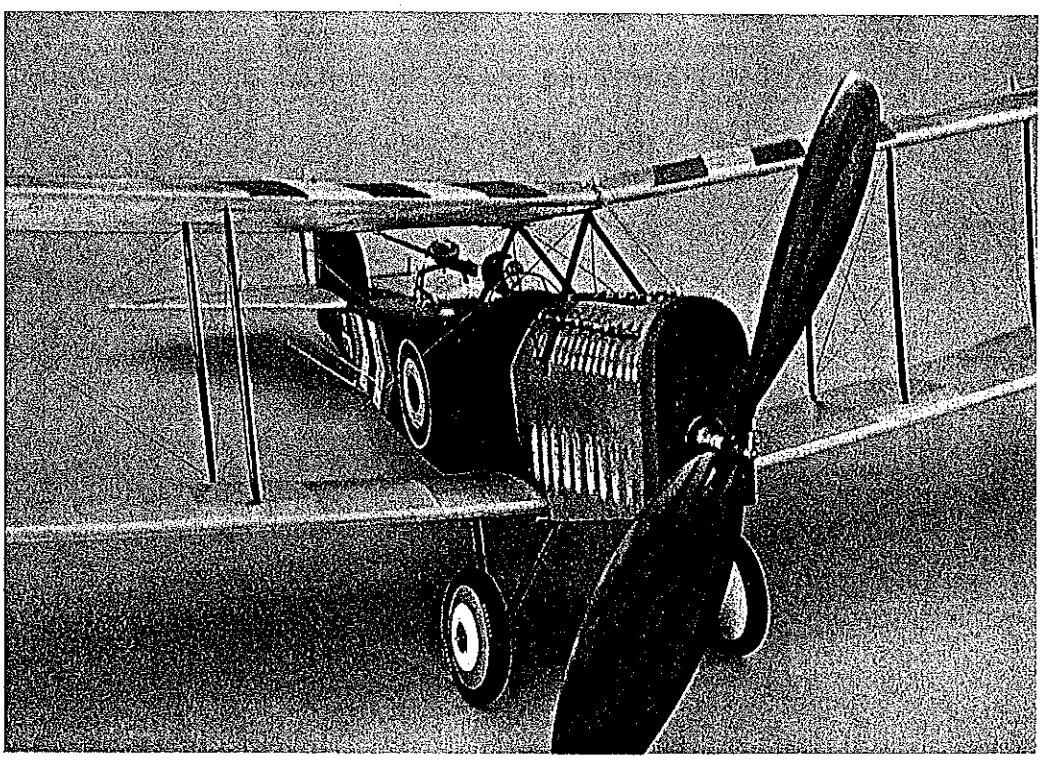




Left: The front cockpit sports simulated instruments and a balsa pilot. Lewis machine gun is made from balsa, painted to represent worn metal. Right: Flying wires between the wing bays contribute to the model's strength. They're made from 2-lb.-test nylon fishing leader.



Under surfaces of the wings and stabilizer are doped with a cream color. The olive drab fuselage repeats the blue, white, and green chevron motif that is found on the upper wings. The model's framework is straightforward and robust. Wings are made for easy removal by means of indexing pins and rubberband retainers. The tail surfaces are also removable. This design typifies 1914-1918 aircraft.



The nose is covered with pressure-sensitive metallic Mylar that is painted flat gray. Normal handling results in paint wear at the louver edges, giving a realistic worn appearance.

THE PROTOTYPE AIRCRAFT was the most successful of a series of armed two-seaters produced by Fabrica Aeroplani Ing. O. Pomilio of Turin during 1917 and 1918. Although the Ansaldo is popularly thought of as the archetypal Italian WW I aircraft, the Pomilio "P" series were produced in greater numbers, the total being in excess of 1,600.

The model has a wingspan of 31 in. making it suitable for Jumbo Rubber class competitions. The design of the PE seems to capture the essence of aircraft of this vintage: simple, robust, and making very little concession to non-utilitarian features. Unsophisticated by today's standards, the design nonetheless has a pleasing plan, with a nicely porportioned moment arrangement, interesting wing, and fan-like stabilizer. The fuselage profile has a sturdy forward portion distinguished by an unusual raked radiator, behind which sat the big 300-hp, 12-cylinder Fiat engine.

The color scheme incorporated on the model is reproduced in a color two-view drawing in the Macmillian book, *Bombers 1914-1918,* by Ken Munson. This book may be out of print, but it can be found in used book stores for a reasonable price.

The author, Bill Noonan, launches the model for a test flight. The Pomilio is a stable flier once the proper balance and incidence adjustments are made. It's a nice-sized model.

of encylopedias sometimes works as a temporary wedge.

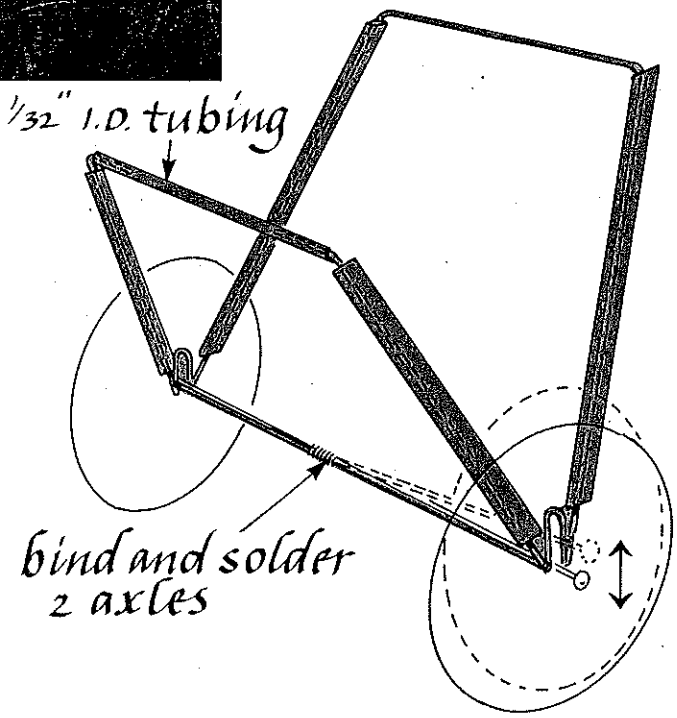
After this basic frame is thoroughly dry, cut and fit a bulkhead of either 1/16 sheet balsa or Styrofoam to completely fill the framing immediately under former E. Cut a 1-in.-dia. hole in the center to allow passage of the rubber motor before cementing the bulkhead in place. This piece serves a number of purposes. It lends rigidity to the fuselage and guarantees alignment. It prevents the fuselage sides from collapsing when grasping the model for a hand launch. Finally, it contributes to the protection of the fuselage innards when the rubber motor thrashes around.

Cut 1/16 medium sheet balsa formers (A through H), and cement them in place. Formers F, G, and H can be notched for 1/32 x 1/8 basswood stringer insertion by using a jeweler's file or folded sandpaper.

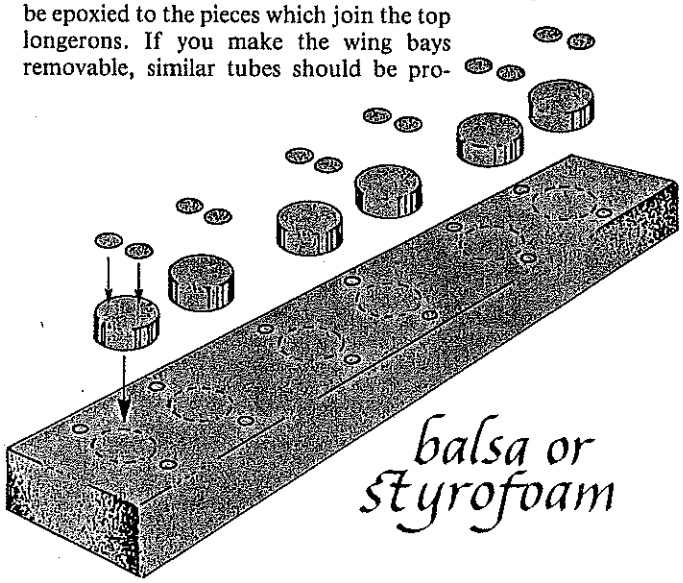
Before covering the forward cowl area it will be necessary to cement two 1/32-in. I.D. aluminum tubes in place to receive the bent wire cabane struts. These should be epoxied to the pieces which join the top longerons. If you make the wing bays removable, similar tubes should be provided at the lower wing roots for insertion of bamboo or aluminum indexing pins to align the wings with the fuselage.

The forward cowl is made by bending straight-grained 1/32 sheet balsa over Formers A through E. The most satisfactory way to achieve this with a minimum of fuss is to make a rudimentary pattern which traces accurately the longeron curve. It will be necessary to cut a slightly undersize cockpit hole before applying the balsa, as this allows the 1/32 sheet to be manipulated when fitting it to the "drop off" between the front of the pilot's cockpit and the front of the gunner's position. Once this decking is cemented in place, carefully sand the cockpit edge to a symmetrical oval. Wetting the outside of the sheet balsa with a diluted solution of ammonia and water facilitates the bending process.

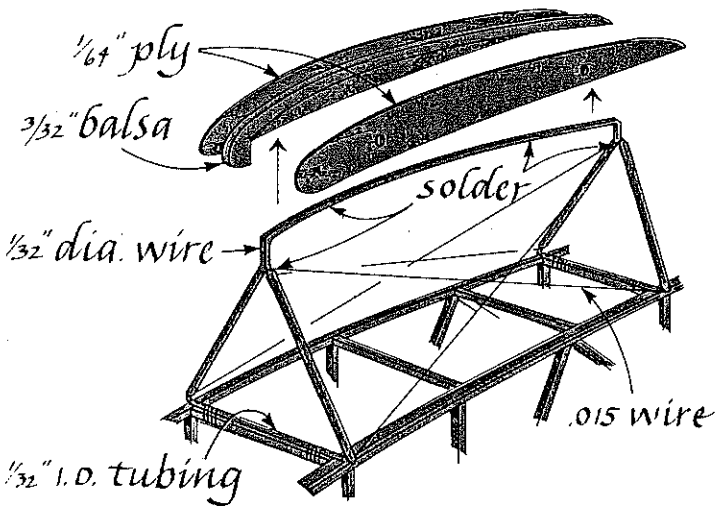
Cut an oval opening in cowling top for engine access. Cut and fit a 1/16 sheet balsa "floor," which fits inside this opening about 1/2 in. below the side cuts. This provides a base for the simulated Fiat engine top to sit on. A 1/32 sheet plywood bulk-



LANDING GEAR ARRANGEMENT



DUMMY FIAT ENGINE



CABANE STRUT ARRANGEMENT

head is made by tracing around the finished nose. This shape will duplicate Former A and the fuselage immediately below. Cut a square hole in the center of the plywood part about 1 x 1 in. to allow passage of the rubber motor.

Cut the nose block from basswood, sanding the contour to mate with the plywood bulkhead. Fit an indexing plug to the back of the nose block, checking the fit by forcing it through the hole in the plywood. Cement the plywood part in place on Former A. Drill the nose block with 3° of downthrust. Insert the thrust button.

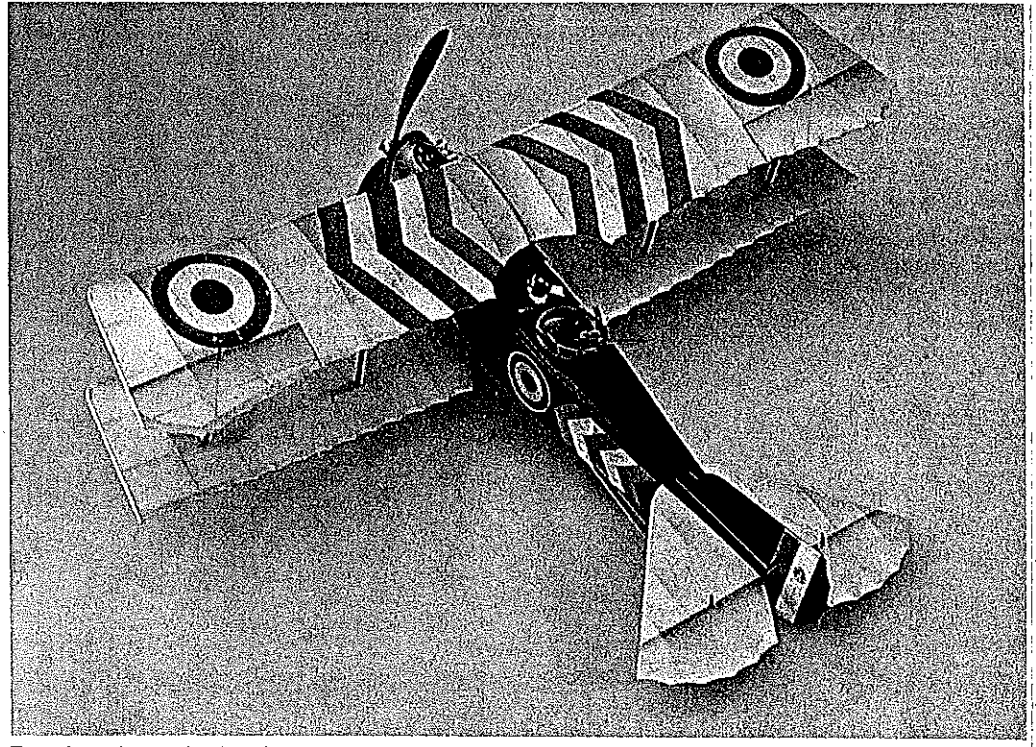
The simulated radiator may be made by cutting out a piece of fine brass filter screen and setting it into the shallow recess at the front of the nose block. It is best to paint the shell before cementing the screen in place.

The decking surrounding the gunner's cockpit is cut from a soft block balsa and contoured to fit accurately with Formers E and F. Cut a 2-in.-dia. hole in the center of this part. A ⅛-in. balsa gun ring will be cemented in place after the model is painted.

The unusual tail skid is built up from 1/32 balsa. Bamboo is used for the skid, itself. The unit will be covered with tissue later. Note that the skid penetrates a piece of hard 1/16 sheet balsa which fills the triangulated rear portion of the fuselage bottom.

Add hard 1/16 sheet filler pieces above the bottom longeron at the lower wing root. The angled lower wing root rib must mate accurately with this portion of the fuselage.

A model of this size tends to put considerable stress on the landing gear, so we incorporated a shock system patterned after aircraft of this vintage. Bend the V-shaped right and left legs, allowing the 1/32-in. wire to cross the fuselage bottom below the front cockpit. Note that the "crotch" of the V has an inverted U bent into it. This is to allow for spring axle travel. On full-size aircraft this was usually controlled by bungee cord. Two 1/32-in.-dia. axles are utilized, the leading one soldered into the bottom of the V, the second soldered at the axle center. See the sketch for the general arrangement.

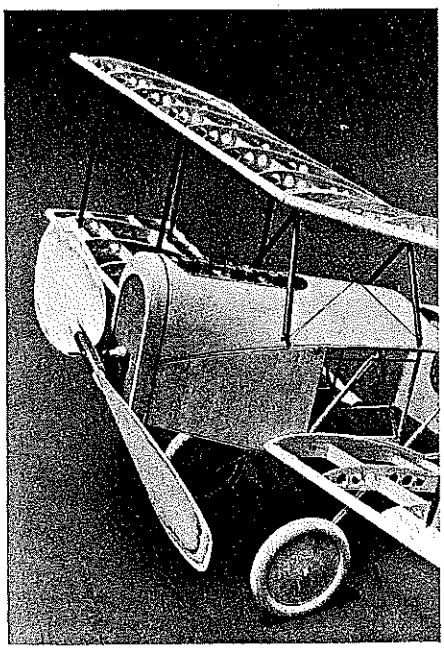


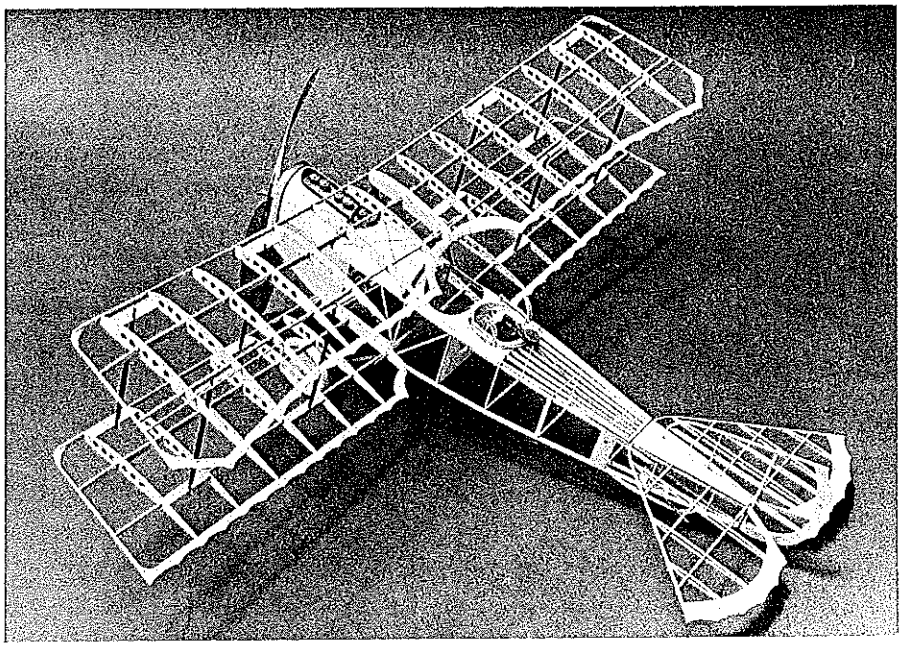
Top view shows the Pomilio's handsome wing and tail plan. Tops of the wings and stab are silver; the chevron markings are blue, white, and green. Care with small details pays off.

It is well to bind the landing gear wire to the fuselage crosspieces with light thread before applying cement. Wire legs should be faired with either oval-sectioned plastic straws or appropriate-sized balsa. A straw sheath can be used to cover the axle assembly. Wheels may be turned on a small lathe from balsa or purchased ready-made.

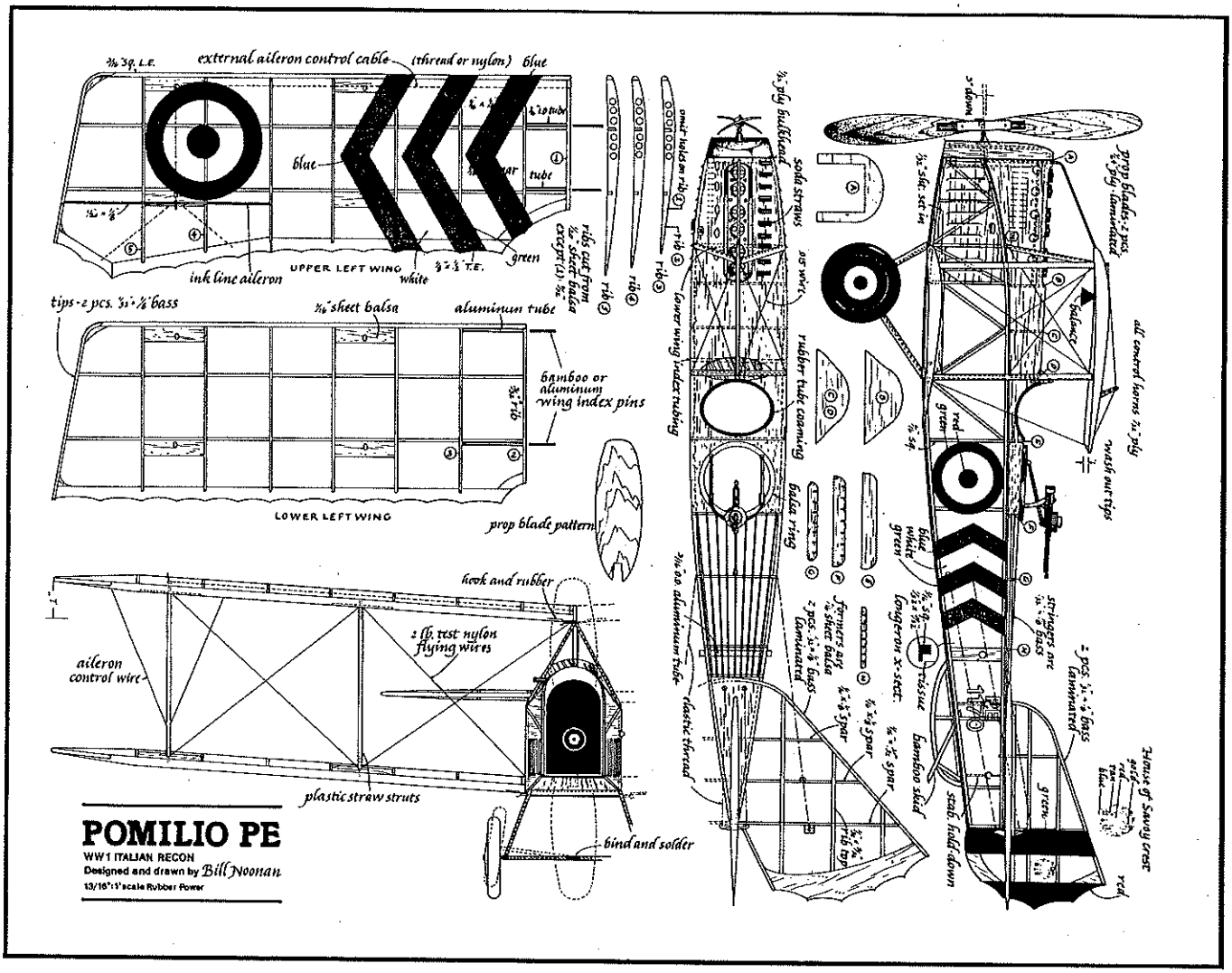
The cabane strut unit is bent from 1/32-in. wire in a fashion similar to the landing gear. The right and left parts are soldered at the apex, and an airfoil-shaped envelope (center section) patterned from Rib 1 is epoxied in place (see sketch). This part is made from two pieces of 1/64 plywood and a 1/32 sheet balsa center. It is drilled to allow passage of the top wing root rib indexing pins which insert in respective tubes in the wings. After the model is painted, this cabane unit "plugs in" the tubes cemented in the fuselage.

Wing construction. Removable wing bays





Left: Radiator/nose block unit is made from basswood (carves nicely and resists damage). Top of the dummy Fiat engine is made from either balsa or Styrofoam. Right: The framework design shows concern for choice of wood sizes to achieve optimum strength relative to weight. Points of high stress, such as at the wing roots and landing gear, are given special attention. Author is a master of the Rubber Scale art.



were incorporated on our model to make transit and storage easier. This feature also minimizes damage if the model flies into a fixed object.

Construction follows conventional practice. Ribs are cut from medium 1/20 sheet balsa, with the exception of the root ribs which are 3/32 balsa. Notching the spar positions with a small file tends to cut down on split ribs. The lightening holes were made by using a common notebook punch. You may wish to dispense with this, as it does result in a few split ribs.

Pin the spars in position over the plans (don't pierce the wood), elevating them slightly to allow for undercamber. Cement the ribs at their respective stations, checking for perpendicularity. Cement the leading edge (LE) and notched trailing edge (TE) in place.

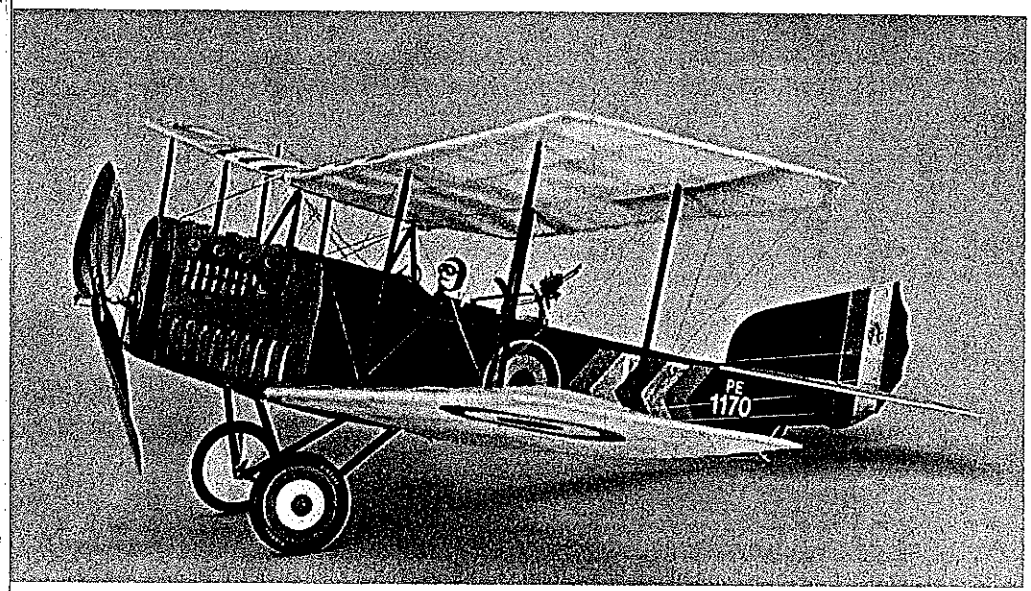
The wing tips are made by bending two pieces of 1/32 x 1/4 basswood around a waxed cardboard form. Soaking the basswood in a solution of hot water and a little household ammonia (not detergent) facilitates bending around the form. Be sure to rinse the basswood thoroughly before applying white glue between the pieces (ammonia causes the white glue to roll up in funny little balls). Allow the bent wood to remain on the form overnight.

Trim the tips and cement in place, fairing them with the leading and trailing edges. Cut and sand the LE and TE to the proper airfoil.

Add a 1/20 x 1/8 balsa strip which breeches the last three ribs on the top wing. This defines the simulated aileron and provides a base on which to cement the dummy control horn.

Add 1/16 sheet balsa strut bases between the ribs, contouring them to conform to the airfoil, then drill to receive the strut stubs.

The removable wing bays are held in place with small orthodontist's rubberbands stretched between .015-in. wire hooks which have been cemented on the underside of the top and bottom wing



A lot of small details add up to an interesting model. Markings are distinctive and in contrast to the utilitarian military color scheme. Lettering and numbers are from rub-off transfers.

Continued on page 176

the CG, try swapping spinners. The trim setup I use gives a better grove, improves wind penetration, and tends to dampen the effects of the somewhat shortish nose.

Here, then, is an airplane that stands literally cockpit stitching and rudder above most others. With a high angle of attack and low gross weight, it gets off rough fields in good order. At a recent local holiday demonstration, I took the Barnstormer out for two full days of actual *barnstorming,* just like the name says. I wasn't especially trying to do a full pattern every flight—sometimes just doing big, sweeping, old-style maneuvers to show the folks what a good CL ship can do.

A few closing thoughts on the Barnstormer: How many of you are game to build one using only Ambroid or Testors glue? I considered this but backed off in a moment of weakness. This was how they were all built, you know. Modelers didn't always build with oak, steel cable, and ferro concrete (or the present-day modeling counterparts).

Lightweight Foam Wing/Evans

Continued from page 85

1/16 capstrip to butt against it.

Cut two strips of balsa at least ¼-in. wider than the leading edge of the foam (about ½ in.) from a sheet of ¼-in. balsa. Glue and pin these to the trailing edge, again centering to allow for the cap strips.

After the leading and trailing edges have dried, mark the cores at 2-in. intervals to locate the cap strips. Mark both the top and bottom of the cores so that the top cap strips are directly over the bottom cap strips. Also, mark the location of the 3-in.-wide inboard sheeting.

Place the wing core top cradle on a flat surface, and place the core on top of the cradle with the bottom side up. Cut the inboard sheeting to fit, and glue and pin it in place on the bottom of the wing. Next, cut the ¼ x 1/16 cap strips to fit between the leading and trailing edges, and glue and pin them in place.

Repeat these steps for the other wing panel.

After the bottom cap strips have dried in place, repeat for the top of the wings. Again, use the wing cradles to help keep the wing free of warps.

After the assemblies are dry, trim and sand the leading and trailing edges flush with the cap strips.

Mark the locations for lightening holes, and cut them with a hole saw.

Cover the wing with a *transparent* film to enable the full effect of your work to show.

The construction, as described, resulted in a weight reduction of 50%—from 16 oz. to 8 oz. The strength has been more than adequate.

Airplane Design/Powers

Continued from page 90

ways, vertically, and off at an angle while maintaining forward speed, thus increasing their ability to outmaneuver their adversaries. When the model industry comes out with such equipment, then stability and CG location will no longer be problems for modelers.

Questions and comments may be addressed to Brad Powers, 5470 Castle Hills Dr., San Diego, CA 92109.

Pomilio PE/Noonan

Continued from page 96

leading and trailing edges at the wing roots. Bamboo or 1/32-in. O.D. aluminum pins about ¾ in. long act as a method of indexing the wings to the fuselage and center (cabane) section. These fit in aluminum tubing in the fuselage and wings. It is important to have all the tubing in exact alignment before cementing it in place. To assure accuracy, it is necessary to assemble the wings with the proper dihedral angle in a temporary jig, then apply epoxy to the wing root tubing which has index pin in place. Allow the cement to dry before disassembling.

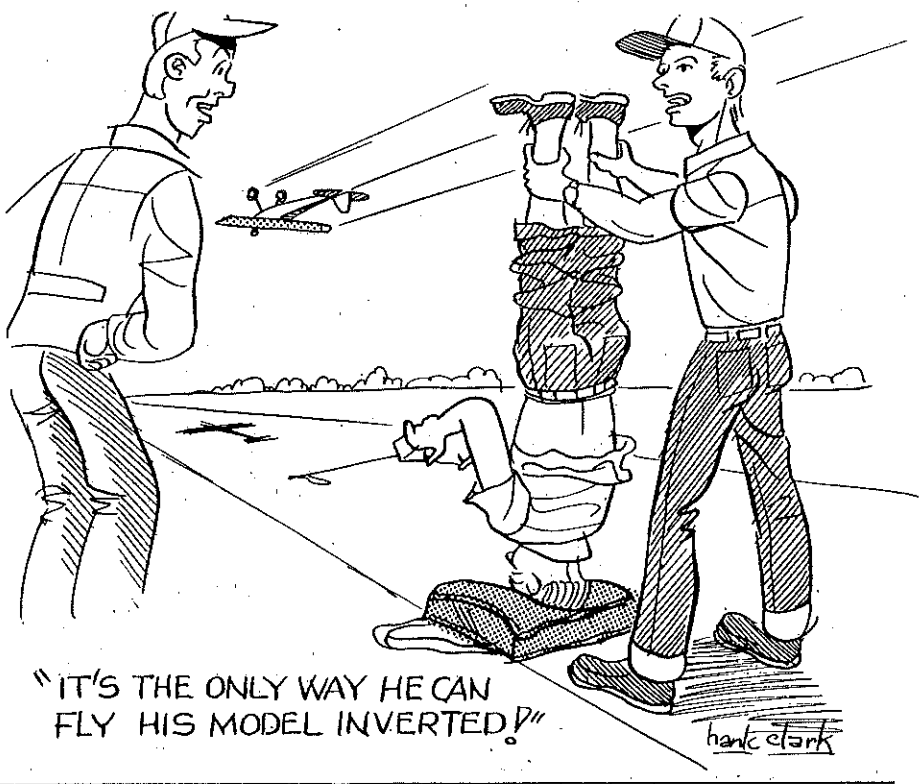
The eight interplane struts may be made from flattened plastic straws or cut from balsa. If you use the straw method, which has the advantage of being virtually indestructible, it will be necessary to insert bamboo slivers about 1 in. long at each end of the strut, allowing ¼ in. to pro-

trude. These are cemented in the holes in the strut bases in final assembly.

Tail assembly. Both the horizontal and vertical stabilizers are built by the "sprung rib" method to achieve a symmetrical, lightweight surface.

Outlines of both are bent from laminated basswood just like the wing tips. Position the finished parts over the plans. Cut the trailing edges from 3/16 sheet balsa, and cement them in place. Cut rib "bottoms" from 1/32 x 3/32 strip balsa; cement in place between the leading and trailing edges. Cut the spars, and cement them on top of the 3/32-width ribs. Cut accurate, duplicate rib "tops," cementing at the leading edge. Gently lift the bottom unit, at the same time bending the top ribs to fair in with trailing edge. You should wind up with a symmetrical section, the contour and thickness of which is controlled by the spars. Cement the ribs at the spars and trailing edge. Trim and sand the leading and trailing edges. This method of construction has the advantage of having a high resistance to warping.

Fill in the center section of the horizontal stab, both top and bottom, with 1/32



sheet balsa in a triangle shape like the fuselage immediately below. The fin will cement to this later on.

The tail unit is removable, held to the fuselage by two rubberbands attached to .015-in. hooks which are cemented to the center section of the spars. These hooks hang inside the fuselage and are accessible from an opening on the bottom. Rubberbands are held in tension by slipping bamboo slivers through them, the slivers running from side to side under the fuselage. The removable tail is convenient, as it allows easy adjustment of incidence during trimming flights. Cement scrap balsa alignment blocks in place after the trim is finalized.

Miscellaneous. Covering should offer no problem. The only area which may require special attention is the turtleback. We covered it with three strips of tissue running across the fuselage, between the formers. The tissue grain should always run in the direction of the long axis of the member being covered.

Our model was covered with white tissue from Peck-Polymers. After shrinking the tissue with a light spray of rubbing alcohol, give the covered model a coat of diluted (50-50) clear nitrate dope.

The marking scheme of the Pomilio is quite colorful, contributing to the charm of the model. Wing and stabilizer tops are silver. The top wing is embellished with blue, white, and green chevrons. This same motif appears on the fuselage sides. The fuselage and fin are olive drab. Wing and stab undersides are cream colored. Italian cockades with a green outer ring and a red center are on the wing tops and bottoms, as well as on the wheels and fuselage sides. The rudder is striped green, white, and red. The House of Savoy crest, found on some military aircraft in 1918, may be applied in the white stripe. We achieved all markings by the masking-and-spraying method. This is somewhat laborious, and you may wish to substitute colored tissue for the sprayed pigment.

Simulated ailerons and elevator separations may be masked and airbrushed or simply defined with a thin ink line applied with a draftsman's pen.

The distinctive cowling and engine area is the focal point of the Pomilio. The sheet balsa may be primed, painted, and detailed with ink, or you may wish to simulate worn metal and real louvers as we did. If so, prepare a pattern for the cowling (back to Former B) by wrapping light paper around the nose and carefully tracing the trim configuration. Trace this on pressure-sensitive (sticky back) chrome Mylar, usually available at better-equipped craft shops. Cut the engine access and exhaust ports. Slot the louver locations, opening them by inserting a dull knife or similar tool. After the Mylar "cowl" has been applied to the nose, the louvers can be stiffened by application to

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will tolerate 1,100 turns and be well within the safety margin if lubed.

Because of the generous wing area, balancing the model is somewhat critical. At least an ounce of ballast inside the big nose will be required. It will be necessary to fiddle around with optimum longitudinal dihedral (incidence) while making adjustments for balance. The original model tended to stall even though the incidence arrangement seemed to be (visually) OK. The final adjustment had the stab with a 1/16-in. shim under the leading edge and the balance position shown on plans. Balance the model with the rubber in place. Once adjusted, the model is very stable in flight, tending to fly in left-hand circles.

The Pomilio PE is a subject that offers the opportunity to make something not frequently seen—and with good flying characteristics. Why not try it?

Good luck.

Radial Engines/Chappell

Continued from page 87

glues. Take care when the time comes to paint the finished engine; test the paint first on some scrap material. Only paints that will not attack the foam can be used. Sig Plasti-Namel works very well, and Testor's Pla enamel is also suitable. I think latex paints are OK, but since I haven't personally used any, I urge you to test first. When testing, allow sufficient drying time for the paint to cure. Occasionally the eroding process is so slow that, at first, you might think that it is not going to bother the foam, but after a couple of hours the damage gradually shows up.

So, without further ado, follow the picture sequence, and construct a radial engine that you will be proud to fasten to the front of your new plane—with the satisfaction that it is your own handiwork.

Elbow macaroni is used for exhaust pipes. Push 1/16 sq. balsa into the macaroni, leaving about ¼ in. sticking out. Push "pipe" into the cylinder side, epoxy into place, and paint with Testors Pla enamel, silver color.

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the inside of cyanoacrylate (CyA) glue. Spray the cowling with light gray Floquil (railroad color). The cowling takes on a very realistic, worn look as it is handled during normal flying, exposing the metal at the louver and cowling edges.

The Fiat engine is made from scrap balsa, primed, and painted black. See the sketch. Powdered graphite enhances the metallic look. Just rub the graphite on the engine part before cementing it in place. Finish off the nose detail by adding exhaust stubs, access hatches, and red paint to the radiator shell. Paint the engine compartment flat black.

We incorporated considerable details to our model that you may wish to dispense with to save weight: carved balsa pilot, instruments, Lewis gun and mount, and simulated control wires. It is important to incorporate the flying wires between the wings, as these contribute strength to the right and left wing bay units. It isn't as difficult as it looks. Start the 2-lb. nylon fishing leader at the wing root and simply festoon it back and forth between the upper and lower strut bases, applying CyA glue at contact points as you go. Each bay will take two "main runs," plus individual X-wires between the interplane struts in the middle of the bays.

The propeller may be made by laminating two pieces of 1/64 plywood which has been cut to shape over a pitch block. Applying white glue between the pieces and binding with a discarded strip of rubber motor results in a blade that is serviceable, efficient, and may be replaced in the field in event of breakage. The blade unit, with a birch dowel hub which is plugged in the brass tube boss, also allows the pitch to be changed by removal of "locking pins" in the brass boss. A 9½-in. plastic prop may be substituted.

Flying. Power the model with four loops of FAI 1/6-in. rubber, 38 inches long. This