Build the PIETENPOL SPORTSTER

Our old friend "Scotty" Mayors offers you plans and instruction to build one of the finest performing flying scale jobs ever presented.

by "Scotty" Mayors

"WAY BACK when the Department of Commerce decided to clamp down on lightplanes, and vetoed the idea of the safe "$700" airplane, Mr. Pietenpol came through with a sportplane which was proved safe, practical, economical, and which, exclusive of labor, could be built for $500! But like the rest of all sweet dreams about planes for the average man on the street, it just went up in smoke.

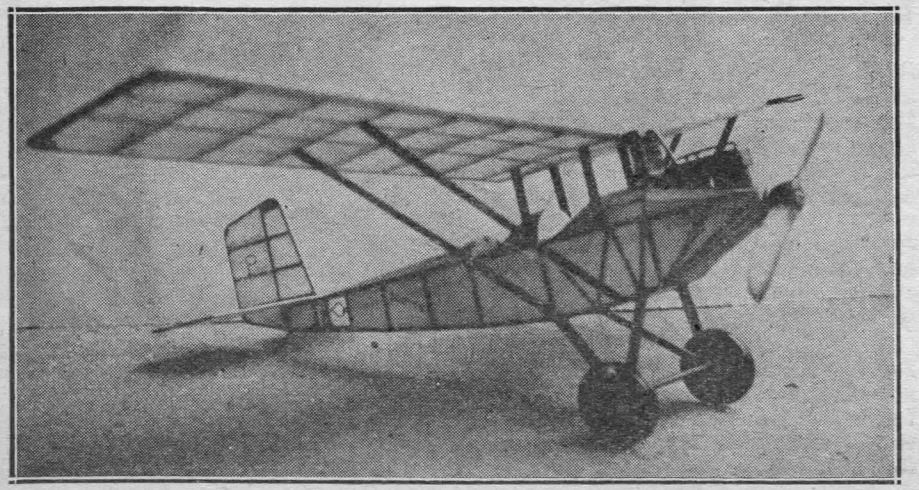
The requirements of the D. of C. were such that Mr. Pietenpol's sportster could not obtain anything but an experimental license. Nevertheless, Pietenpols with but changes in minor details started to crop up all over the country. They were powered with a Ford Model "A" conversion.

A two place ship, it weighed 625 pounds without pilot and passenger. It had a takeoff speed of 40 m.p.h., a landing speed of 35 and top speed around 75 m.p.h. Not so bad for a plane that could be built in a backyard. And it makes an ideal ship for the model builder who wishes a slow-flying, easily constructed, very stable craft.

The model is designed 15/16" to the foot. Changes from the prototype included lengthening the landing gear and moving the front wing strut a bit to the rear, as the wing is placed slightly behind the center of gravity.

The engine is made simply and was taken directly from the original plans as was the rest of the model. Standard size wood is used. Construction is simple, results are gratifying; so let's go.

A miniature flying scale which, from this setting, looks like the real two place job.



Fuselage and Tail Surfaces

MAKE 2 SIDES of 3/32" sq. balsa as shown by the partly filled-in outline on Plates 1 and 2. Connect the sides with cross-members as shown in the top view. This will result in a box-like structure to which will be attached the top fairing and engine bed braces.

Cut formers of 1/16" balsa, eliminating the wood where the black 3/32" squares appear. This is to allow for the 3/32" sq. stringers which give strength and shape to the body. Glue the formers in their respective positions, making sure they remain at right angles to the structure. Now place the 3/32" sq. stringers in position, gluing thoroughly.

It was decided, due to the weight of the dummy engine and drag of the large wheels, that a built up nose would suffice, rather than a nose cut from blocks. Therefore, cut the engine bed from 1/16" flat, and glue into position. A 3/32" sq. brace, running from each top longeron, will hold the bed in position until the glue hardens.

It will be necessary, at this stage, to cut the small circular noseblock from two pieces of 1/8" flat balsa cemented cross-grain for greater strength. Do not cut the hole for the plug until later. Notice the downthrust, which is effected by slanting the noseblock slightly down, and levelling the top and bottom. Downthrust can be used in other manners, so use your own judgment.

Glue the noseblock to the bottom of the engine bed and attach the lower braces of which there are 9. More may be used to fill in if necessary. The braces from former 1 to the top of the engine bed are next to be installed. They are 3/32" sq. Cut 4 cockpit formers from 1/32" flat and glue to number 3 and 5 formers respectively. This sheet balsa should be soaked and bent in the form of an arc before attaching. The tail plug for the rear-hook may now be cut from 2 pieces of 1/16" flat and glued into position. Smear plenty of glue around to assure strength.

The nose plug does not have to be a specific size. Any size plug will do, a hardwood one preferably, provided the inside diameter of the circular block is cut to receive the outside diameter of the plug snugly. As you probably have pieces of 3/32" sq. and 1/16" flat lying around after the completion of the fuselage, it would be advisable to construct the tail surfaces at this stage. The rudder and stabilizer are simply, yet strongly made from 3/32" and 1/16" flat. Cut all the parts to the required shape as illustrated on Plates 2 and 3. The leading and trailing edges should be rounded with sandpaper.

While on the subject of sandpaper, let it be said that a thorough sanding with a fine grade of paper will do much to assure even covering of the model and smooth surfacing to the wooden parts, eliminating drag, and enhancing the finish. This is especially important in the case of the engine, radiator and struts.

Landing Gear and Wings

THE LANDING GEAR is next. Cut 2 front and 2 rear struts from 1/8" by 1/4" stock. Sandpaper to the cross-section shown, and glue to the fuselage. The spreader bar is 4" by 1/8" by 3/8". It is cut and glued to the bottom of the "V's" formed by the landing gear legs. The alignment should be carefully noted. A groove about 1/16" deep is cut on the bottom of the spreader bar, in which a wire, to carry the wheels, is glued securely. The ends of the wire should be bent down in order to give the wheels a slight toe-in. The wheels are 2" in diameter, and may be celluloid or wooden, provided they are light in weight. A washer is placed between the wheel and the spreader bar, and the ends of the wire turned up to secure the wheels.

A tailskid, made to simulate leaf springs, is cut from scrap balsa.

Wire, run down the rear of the fuselage to make contact with the ground, will serve to make a strong unit. Glue, spread generously, will help.

The curve used on our model is close to the Eiffel 36 with increased ordinates, and as it did the job admirably for the real ship so does it work for the model.

Cut 15 ribs from 1/16" flat balsa, eliminating the wood necessary for the spars. The black circular spaces may also be disposed of with some manner of punch. This will lighten the rib considerably. Be certain that each rib is the same as its mate in order to allow for smooth covering.

Two spars for the wing, 1/16" by 1/8", are cut to size, and marked for the rib placement. Doubling the top view of the wing will give the exact measurements which are 7/8" from the center rib to the first rib, to which are attached the center section struts. The others are spaced 1 3/4" apart. Glue each rib to the front and rear spar, after which the leading edge, cut from 1/4" sq., can be glued into position. The trailing edge is 1/16" by 1/4" and should be notched to receive the ribs before they are glued. The tip is cut from 1/16" flat. Gussets are cut from the same material. Sandpaper the trailing and leading edges and wing tips so that a smooth surface is presented before covering is applied.

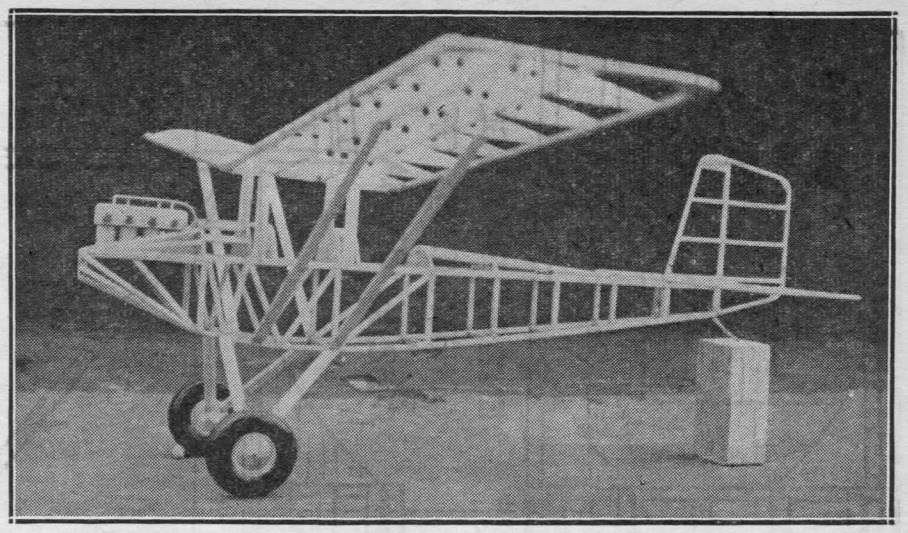
As to the dihedral, crack the leading edge, spars, and trailing edge, and prop each wing tip until an angle of 1 1/2" on each side is obtained. Smear plenty of glue around and in the cracks and allow to set. It is not quite necessary to use so much dihedral as pendulum stability is assured, due to the high wing mounting. However, for beginners, the author suggests using the dihedral given in the plans.

The center section struts are cut from 1/8" by 1/4" and streamlined to the shape shown. The wing brace struts can be cut to size as shown, or made by the cut and try method after the wing has been mounted.

COVERING AND ASSEMBLY

COVERING the model is the next procedure. A good grade of colored tissue should be used. Cut panels and strips to cover the fuselage, using heavy dope or banana oil for adhesive. Large panels can be cut to cover the tail surfaces. In covering the wing, the paper is doped onto the leading and trailing edges, and the bottom of each rib, in order to maintain the proper curvature. It is not necessary to dope the paper to the top of each rib. Separate pieces of tissue should be used to cover the wing tips.

Spray water on the tissue and allow to dry. Afterward two coats of light dope should be applied. The paper should be taut and fairly moisture-proof after this. It is advisable to paint all the struts before their attachment. The color used on the original model is light blue covering throughout, with black struts, grayish black engine, and white ink lettering.



Simple construction makes the Pietenpol Sportplane a pleasure to build and fly.

Place the stabilizer directly on top of the fuselage and glue securely, cutting away the covering so as to permit the direct adherence of wood to wood. The rudder is glued directly to the rear of the fuselage. Perfect alignment of tail surfaces is *absolutely* necessary.

Cut away the covering between formers 2, 3, 4 and 5 respectively to allow gluing of the center section struts. The front struts are slightly longer than the rear struts, in order to allow a small amount of angle of incidence. The paper on the underside of the center section ribs is removed to allow the center sections struts to be glued to the wing. Be certain that the wing is glued securely to the struts, and in perfect alignment with the tail surfaces.

The wing brace struts are glued at the fuselage as shown and run parallel to each other out to the third rib in from the wing tip, at which point the paper is removed from the rib to provide a good gluing surface. Four cylinders, 1/2" long, are cut from a piece 3/8" sq. by 2" and rounded. The cylinder head is a block 3/8" by 5/8" by 1 7/8". It is slightly rounded on all sides and corners. Cut from reed or dowel 1/8" round by 1 1/2" long, 4 exhaust stacks 3/8" long.

The ignition is best simulated by thin reed cut in short lengths as shown, the main lead extending from the front spark plug to the rear of the cylinder head, disappearing into the fuselage. The radiator is cut from a block 1 3/16" by 7/8" by 5/16". It can also be built up from flat pieces if desired. The two water pipes are cut from reed.

Assemble the engine by gluing the cylinders to the bottom of the cylinder head, the spark plugs and ignition lead to the top of the head, and the exhaust stacks on the left hand side of the head as seen from the rear. This unit is then glued to the engine bed. The radiator is glued between the wing and the first bulkhead. The top water pipe leads from the middle of the radiator to the rear and top of the head, and the side pipe from the rear and side of the radiator to the bottom of the head between the last two cylinders. The entire engine is painted grayish. The tubing in the radiator can be simulated by coloring with ink, or with a mesh-like material or cloth.

The propeller is cut to shape from a block 7 3/4" by 1 3/8" by 3/4". The blade section is left rather thick, with a slight concave on the face of the blades. A rounded hub or boss is preferable. A scale prop cut to the shape of the propeller used on the old Jennies may be used for effect. It should be six inches in diameter.

Brace wires in the form of silver thread are run between the landing gear legs as shown, diagonally between the wing struts, on the right side of the center section struts, and between the two rear and two front center section struts. No bracing is applied to the left side of the center section in order to allow accessibility to the front cockpit. Wires also run from the middle spar of the rudder near the top to the front and middle spars of the stabilizer, and from the stabilizer down to a point just ahead of the tail skid. The thread is glued at each point of contact.

Gliding characteristics are excellent. The model should be launched shoulder high with just a slight forward and downward motion. Adjustments to secure a good glide can be made by warping the elevator slightly. Do not add weights in any form. In the glide, the model should land on the wheels, tail high then settle slowly.

Flights are just what should be expected of a model weighing 1 1/2 oz. with a wing area of 104 sq. in. Connect 6 1/2 feet of rubber in 3 loops between the prop shaft and rear hook, and try a few hand launched flights on about 50 revs. Get a stout winder, good rubber, correct downthrust, setting, and a kindly thermal, then watch the Pietenpol go to town.

THE END