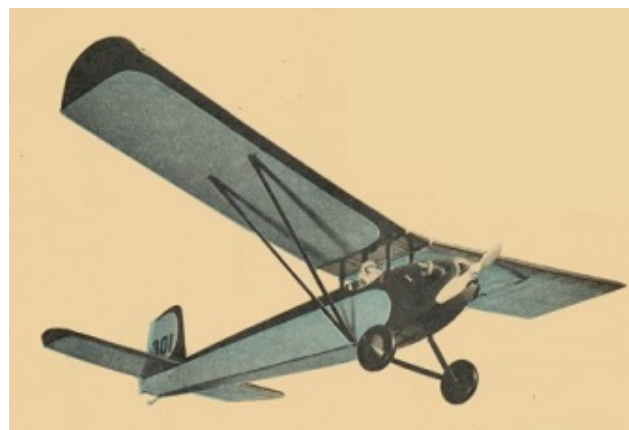
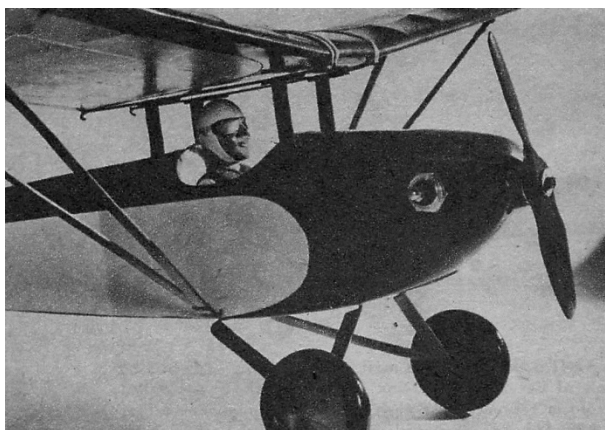


Gazookus



Something very special for the free flight fans a semi scale version of the popular prewar home built single seater light plane.
By S. Calhoun Smith.

Time was when a model builder feeling the urge to really fly, could round up the necessary spruce, tubing, fabric and motorcycle engine and proceed to build a ship of his own. The CAA changed all that, and nowadays a little more is required before the home builder can get aloft in his own creation.

The pages of aviation history filled by the home builders from about 1920 to '33 record a very real part of the growing pains of our then infant aviation industry. As a result, plenty of today's light planes can trace their lineage back to the Heaths, Pietenpols and Corbens.

Our free flight design borrows most of the features of a typical home built single seater and lends itself very well to sport type flying with the smaller engines.

Wing area is 212 sq. in., weight is 9 oz. With an .049 Cub performance is pretty tame, which precludes any long cross-country chases. With the .074 more lively flights resulted, but we doubt if it could chalk up any 10 minute averages. The ship has enough wing area to handle an .099 and good contest performance should result, although the design is not primarily intended for such flying.

Construction follows conventional methods and is started with the fuselage. Cut the fuselage sides from medium hard 1/16" sheet. Sand the outside surfaces before any building is started. The inside of the

forward nose section is faced with 1/32" plywood from the firewall back to former 5. This adds a minimum of weight with greatly increased strength needed to support the firewall, wing and landing gear struts. Cement the 1/32" plywood to the inside surfaces of the 1/16" sheet sides and let dry at least overnight. Pile a dozen old copies of AT on these assemblies to insure a good joint.

While the sides are drying the formers can be cut out. The firewall is cut from 1/16" plywood. Next come formers 2-3-4, these being sandwiches built up around the landing gear and cabane strut wires. Bend these parts to shape now from the specified wire size. Assemble the sandwiches, clamp and allow to dry thoroughly. Formers 5-6-7-8 are cut from 3/32" sheet to the rectangular shapes shown. Lightening holes may be cut if you desire. The semi-circular top formers are cut out and notched where needed for the stringers.

When the sides and sandwiches are dry, assembly can be started. The fuselage sides are parallel back to former 4, so the first four formers serve to line up the fuselage. Assemble the sides over the top view, blocking up as needed to insure square alignment. When the front formers are well set, work back towards the tail, adding formers 5-6-7 and 8.

When this basic structure is dry it can be removed from the work board. The 1/16" sheet bottom can be added now. The tailskid wire can be cemented in place. Add 1/16" sheet at the tail to reinforce the stabilizer mount. Doublers of 1/16" sheet are added inside the fuselage at the landing gear positions. If you wish to add additional strength at the firewall, landing

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gear and cabane strut formers, 3/16" triangular gusset strips may be cemented along the side and former joints.

The firewall is backed up with two strips of 1/4" x 3/8" hardwood to serve as purchase for the engine mounting wood screws or bolts. Decide whether you wish to mount the engine horizontally or vertically and place the hardwood strips accordingly.

A 1 3/4" length of 1/16" O. D. aluminum tubing is cemented across the inside of the bottom of the fuselage at the junction of the V wing struts. This serves as the anchor point for the wire end of the wing struts.

With the interior work completed on the fuselage, the top formers and rear stringers are added. The cockpit outline can be cut from Bristol board or heavy bond paper and cemented in place. The top section between the firewall and former 3 can be completely planked tight after a permanent engine and tank installation is made, or it can be made removable for access to tank for cleaning and engine removal.

Either way, temporarily install the engine now and proceed to finish off the nose section. This is built up of 1/4" and 3/8" sheet scraps with proper openings cut for engine cylinder and throttle.

Any type tank can be used and its installation should be made now. We used a small Darwin wedge tank mounted so that the wedge pointed downward. It was placed directly behind the firewall. A Spitfire timer valve was used in the fuel line with excellent results.

The steel wire wing mount is completed next. To avoid a poor soldering job, wrap joints with fine copper wire and use a hot iron. Check alignment carefully before final soldering. It would be a good idea to block up the wires with a simple jig of strip balsa and pins before soldering. This about completes the fuselage except for the 1/16" x 1/4" balsa fairings on the struts. These can be omitted if simplicity is desired, but we think they add to the model's appearance.

Wing construction is next: cut out the required number of ribs from 1/16" sheet. Note that the two center section ribs are 1/8" sheet. Notch these and the two adjacent 1/16" ribs for the spar and plywood joiner thickness.

Build two wing halves. Lay down the spars and trailing edge over the plan, cementing the ribs in place. Omit the four center ribs until after the panels are joined? Add the 1/4" sq. leading edge next. Join the two wing halves with the 1/16" plywood spar joiners held flat on the work board.

Block up the tips to the required dihedral angle and align carefully so no warps result. Complete the center section by adding short lengths of leading and trailing edge, spars, and the four center ribs. Add 1/8" sheet gussets where shown and allow wing to dry thoroughly before removing from the board.

Cut out the 1/8" sheet tips, bevel the spar ends and cement the tips in place. Plank the top of the center section with 1/16" sheet. The bottom of the center section can be covered with celluloid or 1/16" planking and nylon. This will protect the bottom against the wire mount rubbing or puncturing it. Sand the leading edge round before covering is applied.

The outboard ends of the V wing struts attach to the wing with wire ends projecting through wire eyes mounted in the wing. These eyes can be bent from wire as shown cemented to strips of 3/16" sheet placed alongside the rib flush with the bottom surface.

The horizontal stabilizer is built in the same manner as the wing. Cut out ribs, lay down spar T. E. and L. E. and don't spare the cement. Center section is planked with 1/16" sheet across the bottom, then the 3/32" sheet fin is cemented in place and top planking is added, extending to the sides of the fin.

Lightly sand all parts to be paper covered and then proceed with the covering. One sheet of Silkspan or Sky-Sail will do the whole job if the fuselage sides are left uncovered. If you wish the additional strength, lightweight paper can be doped on over the balsa sheet.

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Two coats of clear and two coats of colored dope should be enough for a neat job. Fewer coats if contest flying is planned. A coat of fuel proofer is a "must" on the fuselage outside. The nose section around the engine should get two or three on the interior where glow fuel is apt to collect.

Final details can be added now. The V wing struts are of 1/16" x 1/4" hard balsa with short lengths of wire thread wrapped and cemented to the ends. Locate these carefully so that the struts do not warp the wing when installed. The struts can be removed when flying if desired.

Scale type wheels were used on the original and built up of 1/8" plywood sandwiched between two layers of 1/8" sheet balsa. A paper cone on the outside added the finishing touch. Regular rubber wheels can be used, but watch the weight and balance.

If you care to simulate the horizontal opposed engine used on many of the old home built, the engine should be mounted horizontally with a dummy cylinder on the opposite side. The dummy cylinder can be made up of disks of cardboard and balsa and painted like the real engine. Short lengths of dowel can be cemented on the sides to simulate exhaust stacks.

Outlines are included for the dummy pilot. This happy character can be carved from a block of soft balsa and painted with any degree of sunburn you may like.

The usual preflight precautions should be taken. Test glide carefully and be well satisfied with turn and sink before turning on the power. Balance should be about one -third of the chord back from the leading edge. Partial plugging of the intake stack is good to retard the power for test hops.

Make short engine runs and correct any extreme turn or climb with incidence change in wing and tail and side and down thrust on the engine. Happy landings!

Bill of Materials

(Balsa unless otherwise specified)

2 pcs 1/16" x 3" x 36" fuselage and all ribs. 1 pc 3/32" x 2" x 36" fin, formers. 1 pc 1/8" x 2" x 36" wing, stab, ribs, tip. 2 pcs 1/8" x 1/4" x 36" wing stab spar. 2 pcs 1/8" x 1/2" x 36" wing spar, stab T.E. 2 pcs 1/4" x 1/4" x 36" wing, stab L.E. 6 pcs 1/16" x 1/4" x 36" stringers, struts. 1 pc 3/16" x 3/4" x 36" wing T.E. 1 pc 1/4" and 3/8" sheet scrap nose. 1 pc 1/4" x 3/8" hardwood scrap engine mount. 1 pc 1/32" plywood 5" x 12" fuselage sides. 1 pc 1/16" plywood 2" x 3" firewall. 1 pc 1/16" plywood 1 1/2" x 6" spar joiners. 4 ft .040" steel wire, struts, L.G. 1 ft of .062" steel wire, landing gear. 1 sheet heavy Silkspar or Sky-Sail. 1 pair 2" dia. wheels.

Cement, clear and colored dope as required, fuel tank, Spitfire Timer Valve.