

Aeronca Champ

By Doc Mathews

A "Silhouette Scale" version
of an all time favorite.

I can hear the comments already. "Good grief, another Aeronca Champ!" "The subject has been modeled over and over again, the magazines are full of them and there's a whole bunch of kits". That may be true, but here's my side of the story.

When the long latent urge to build a "Champ" struck recently I checked over my extensive bibliography and some catalogues to determine what was available. Much to my considerable surprise, the preponderance of published Champs have been 1/2A free flight designs. Certainly several slab sided windowless "Champs" have been published and kitted, but I'll be darned if I could locate anything like I wanted.

While no obvious explanation for the oversight is apparent, it is certainly regrettable. Perhaps no other American light plane possesses more visual charm than Aeronca's Champ. If one were to draw a caricature of this pot bellied, stub-nosed charmer, it would no doubt resemble some talking airplane in a Walt Disney cartoon. This charm is the underlying motivation in developing the design for publication.

Although the "Champ", as presented in this article, is of scale dimensions, some deliberate liberty has been taken to simplify construction. At first glance, this "Champ" is identifiable either on the ground or in flight, yet it would certainly not satisfy the scale perfectionist with his 3-views and ruler.

Design and development was directed toward producing a light, well stressed, stable flying model that was easy to construct and maintain. It's silhouette is recognizable as a Champ, yet it is much less complex than a stand-off or museum scale. Therefore, we refer to these oversized 10¢ rubber models as "silhouette scale".

Originally powered with an inverted O.S. Max 15, the model was a very lively performer. After photographing and flying the "Champ" for a while in the original form, we opted to abandon the inverted engine with its associated annoyances. An upright 16 year old Enya .09 was retrofitted, converting the model into an absolutely delightful school-yard sized sport "putt-about".

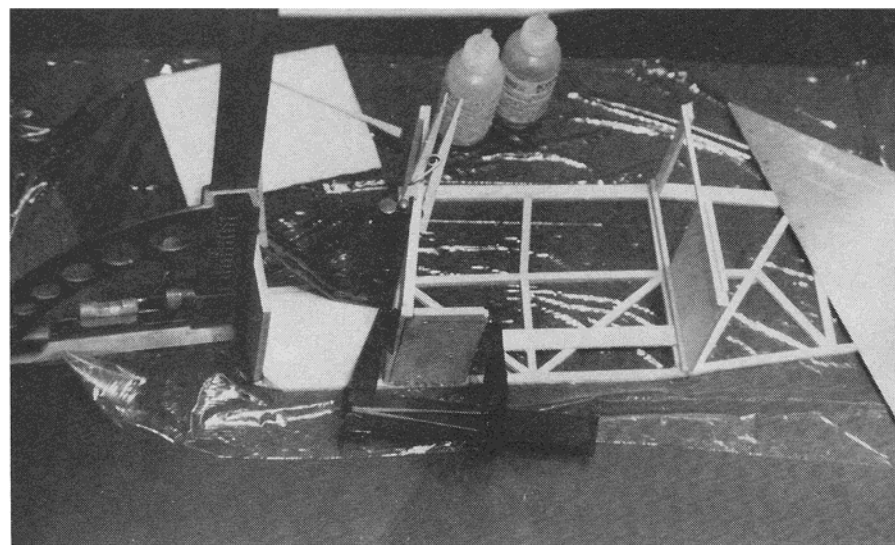
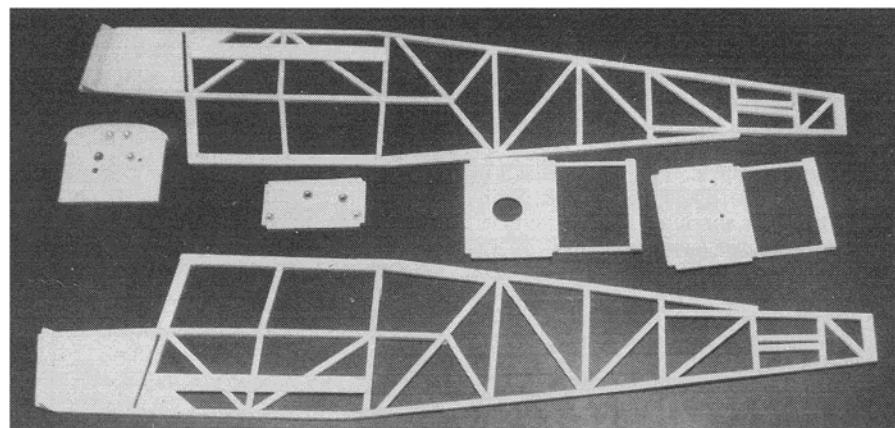
Potential builders who desire an inverted (concealed) engine are certainly encouraged to take that route. If, on the other hand, utility and ease of maintenance are more important than "impression points", stick the engine out in the breeze!

Flying characteristics are outstanding! With the .09 the model takes off the deck af-



PHOTOGRAPHY: DOC MATHEWS

Classic lines of Aeronca Champ show through in Doc's sport scale model (above). Finished sides, bulkheads and landing gear mounts (below). Mounting holes with blind nuts must match engine and gear used. Interlocking bulkheads being installed in fuselage (bottom). Fuse is built on flat surface. Easy construction.



ter a tail up roll of about 15 feet (dependent on wind velocity and grass length). She cruises around a 50-60% throttle for 10 minutes or more on just 2 ounces of fuel. Landings are slow, gentle and not the least bit unlike those of an old timer converted to R/C. Touch and goes are a thing of beauty even in brisk winds, and the "Champ" is willing to shoot landings as long as the pilot has the urge. This

model can be classified as an excellent trainer with the added bonus of scale appearance.

Construction

All balsa and spruce joints are glued with aliphatic resin such as Sig-Bond or Tite-Bond. All plywood joints use five minute epoxy. Wood sizes and hardware items are all standard stock. No unusual tools are required.

Some care should be exercised in wood grade selection, the model weight is not critical, but should not exceed 3½ lbs.

Tail group

The empannage is totally straight forward in construction. For the sake of simplicity, we like to cut the tip outlines after assembly. The elevator connector wire is more easily epoxied if this step is executed before cutting the halves apart. Hinges should be permanently installed, after covering, using tooth pick segments pushed and cemented into pre-drilled holes.

Wing

The wing rib ply master pattern can be developed with carbon paper, tracing paper, or by ironing a Xerox print onto the ply. Cut the ribs from a stack of light "C" grain sheet using a jig saw or by carving and sanding them.

Build the wing panels, from the bottom up, over the drawings. Cut bottom spars flush with the outside of the tip rib, position the light ply tips, then cut the top spars to match. The center section is built integrally with the left wing, then cut.

By tilting the inside wing ribs, using the jig, one need only block up the wing panel and sand in the bevel using a table edge as a guide.

No dihedral gusset is shown on the plans as our experience indicates a better way to develop a good fitting joint. After the three sections have been epoxied together at the correct dihedral, cut through the ribs using hack-saw blades taped together. Place a blank section of plywood into the slot and mark top and bottom spar lines. Remove the ply and cut to the lines, you now have a gusset that fits the exact dihedral angle you came up with.

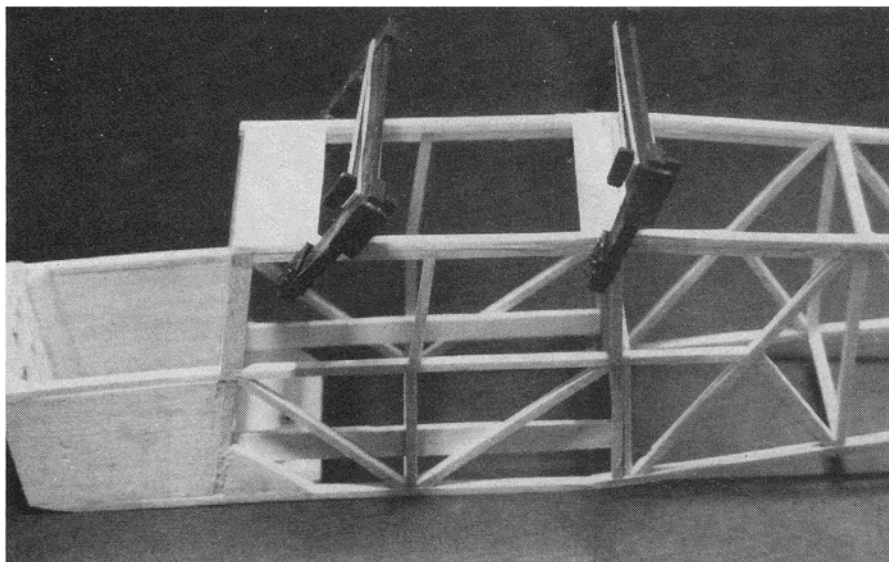
Carve the leading edge stock to outline, sand the entire wing and set it aside awaiting its use in the fuselage construction.

Fuselage

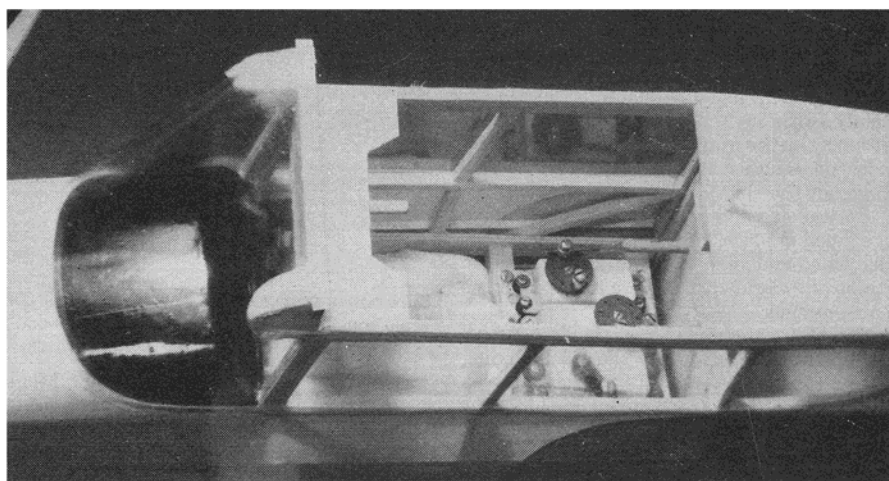
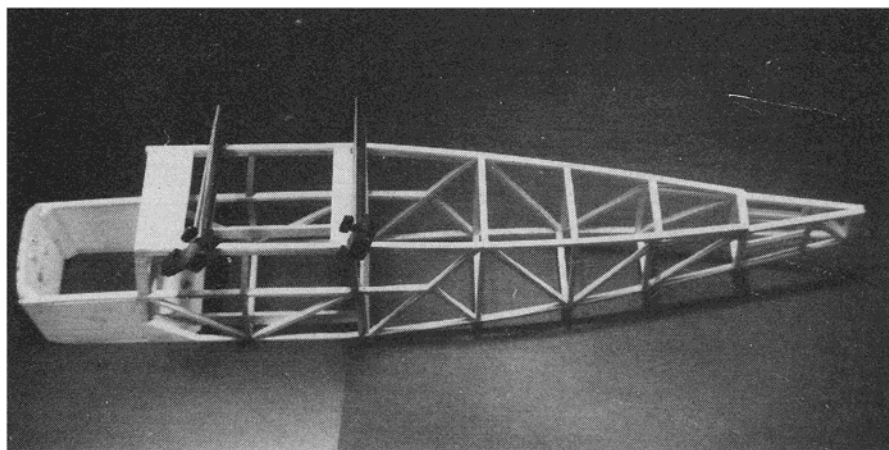
Two identical sides are constructed, one atop the other, in the classic 10¢ rubber model technique. The triangular stock is fitted for the firewall, the bulkheads fabricated directly over the plans, all holes are located and drilled and the box constructed. Pin the right unit flat over the side view, install the four major forward section units, checking for squareness with a triangle, and epoxy them into the slots in the right side.

Inset the left side onto the bulkheads to complete the forward fuselage box. Block up the tail post 1½" at the mid line and pull the left post down onto it (use epoxy here). Balsa cross pieces are cut to length over the top view and glued in place with the fuselage still pinned down on the board.

The ply wing saddles are epoxied in after the fuselage is free of the board. Epoxy the ⅜" dowel onto the front saddle with the fuselage inverted. This *does* need to be in the center line. Place the completed but uncovered wing onto the saddles and drill a hole through its trailing edge down into the ply mount. Epoxy a threaded hardwood block onto the underside of the ply by pulling it up with a lubricated bolt run through the wing and ply saddle.



Top wing reinforcements are added after basic assembly is removed from building board (**above**). Clamps hold parts in place. Fuselage with formers, firewall and reinforcements glued in place (**below**). Simple, but it looks scale-like. Radio installed on basswood cross members (**bottom**). Small blocks fill windscreen.

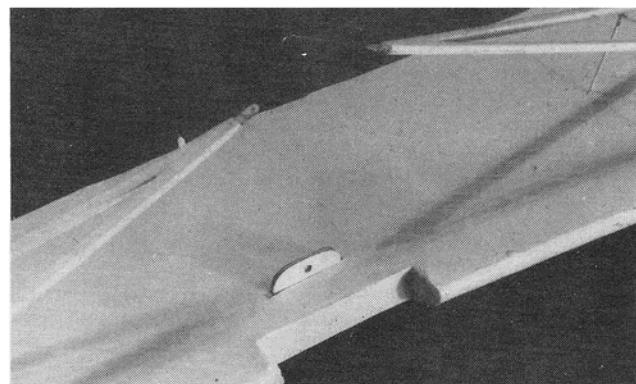
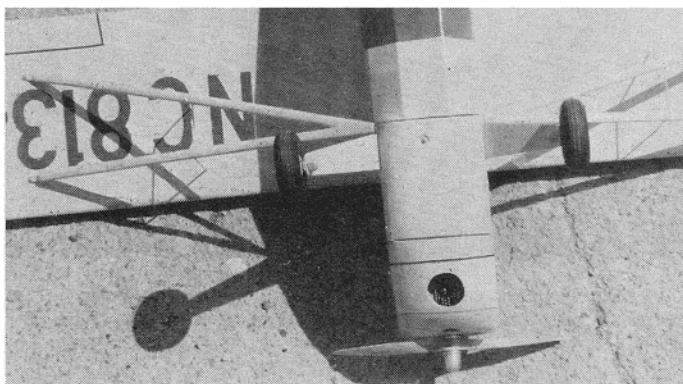
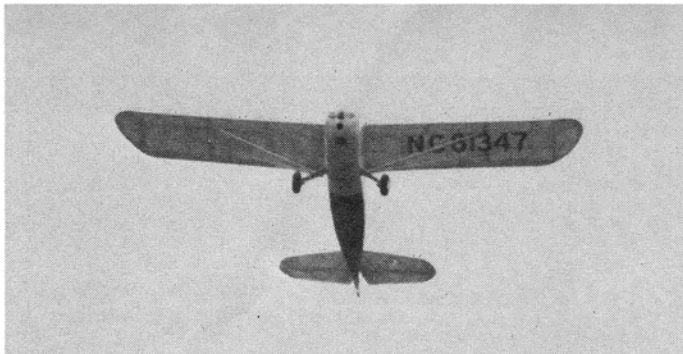


With the bolt still in place, position the wing "dowel grabber" onto the protruding dowel, then epoxy it to the spar rear faces. Add the windscreen frame and filler blocks with the wing still in place. Carve blocks to blend with the contour before removing the wing.

Cowl blocks are laid up and rough cut to outline, spot glued onto the firewall and

carved to shape. Pop the cowl loose, release its interior to clear the engine, and cut ample air passage holes and vents. Add cowl hold down blocks, replace the cowl and drill through it and the blocks for 4-40 bolts and blind nuts. Repeat for the removable bottom hatch block.

The aluminum landing gear is a stock Sig catalog item cut in half and redrilled for addi-



Champ in flight (top). Scale outlines make plane look realistic as it cruises overhead. Undercarriage (above). Note wing struts, hatch.

Another flight shot of Champ (top). Detail shot of wing center section and struts (above). Construction is simple but functional.

tional bolts. Use the gear halves as a drilling guide to locate the blind nuts and 4-40 bolts. Banner wheels and axles will require increasing the axle hole to $\frac{5}{16}$ " and are certainly worth the effort.

Radio installation utilizes $\frac{3}{8}$ " square bass or pine cross members for the servo trays, they are epoxied and screwed onto the integral light ply rails. Move the unit fore and aft to locate a slightly nose heavy C.G. (to compensate for weight build up on the aft end). The battery pack (450 mah on the prototype) and tank will both fit nicely inside the front compartment. Even a four ounce unit can be used if it is arranged with its long side flat against the fuselage side.

We used flexible tube pushrods for rudder and elevator, and cable for the throttle, if the builder prefers $\frac{1}{4}$ " balsa pushrods there is certainly sufficient room for them. Use rubber stoppers on the front of the bulkhead pushrod passage, roughen them, then epoxy the passage out the slots in the rear.

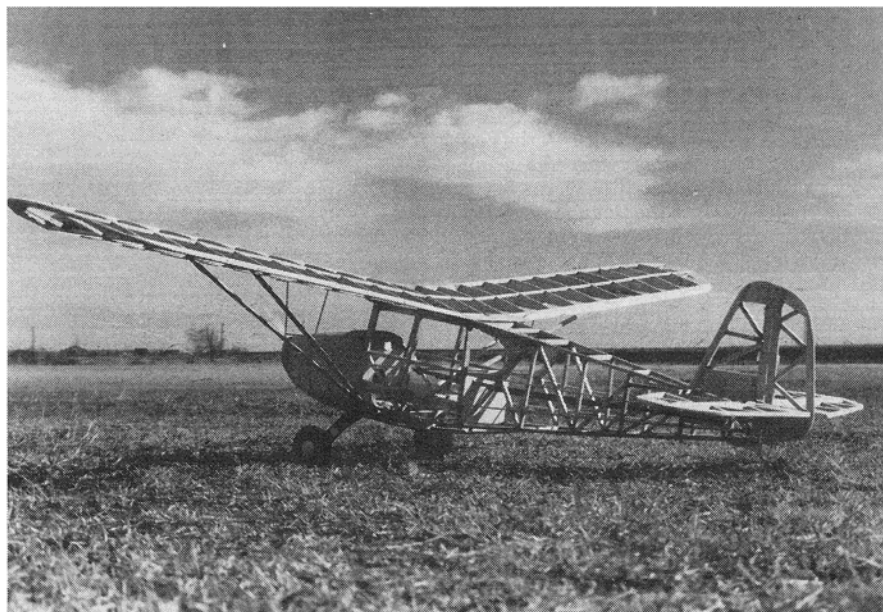
Spruce side and bottom contour stringers are glued in place, then block sanded to a taper front and rear to blend into the sides. Light ply window frames are installed in the same manner.

Struts are assembled over the drawing using epoxy, slots are cut for the nylon landing gear straps, then the struts are sanded to an airfoil shape. The straps are epoxied into the slots, then reinforced with toothpick sections placed into $\frac{1}{16}$ " holes drilled through the ends. The wire portion of the struts must be slightly wider than the outside of the Robart mini-hinge halves to prevent tearing.

Fit the struts with the wing bolted onto the fuselage. Push the straps tightly into the space between fuselage bottom and the block, then drill $\frac{1}{16}$ " holes through the nylon and into the wing plate. Repeat for the wire strut holes.

Finish

The "Champ" is sufficiently strong enough



Bare bones shot of Aeronca Champ shows off plane's construction. The framework gives the impression of scale construction with rather simple framework. It's another sport scale ship with charm. Give it a try.

for covering with most any material. Mono-Kote™ was used on the prototype's wing, while FabriKote™ was applied to the fuselage and tail. We sprayed the fuselage with yellow polyurethane, then masked it off with electricians tape and paper to apply the red polyurethane. The edges were trimmed with vinyl tape.

The numbers are sticky backed, die-cut, EZ Stick units from a office supply. The windscreen and sidelights were stuck down with Wilhold R.C. 56 adhesive, then edged with Sig Stripe Rite tape.

The cowl and other wood parts were first filled with Hobby Pox filler then sprayed with the paint. The interior of the cowl and

the tank compartment should be fuel proofed with polyester resin.

You can remove the wing with the struts screwed on, by unscrewing the nylon bolt, pulling the strut ends out of the fuselage slots, and sliding the wing clear of the dowel. Needless to say, access to the tank, R/C equipment and engine are excellent on this model.

Flying

There are really no precautions required in flying this model. Just point its nose into the wind and advance the throttle, she'll do the rest. To land her just reverse the power setting. In between these two steps, the flight envelope is for you to enjoy!