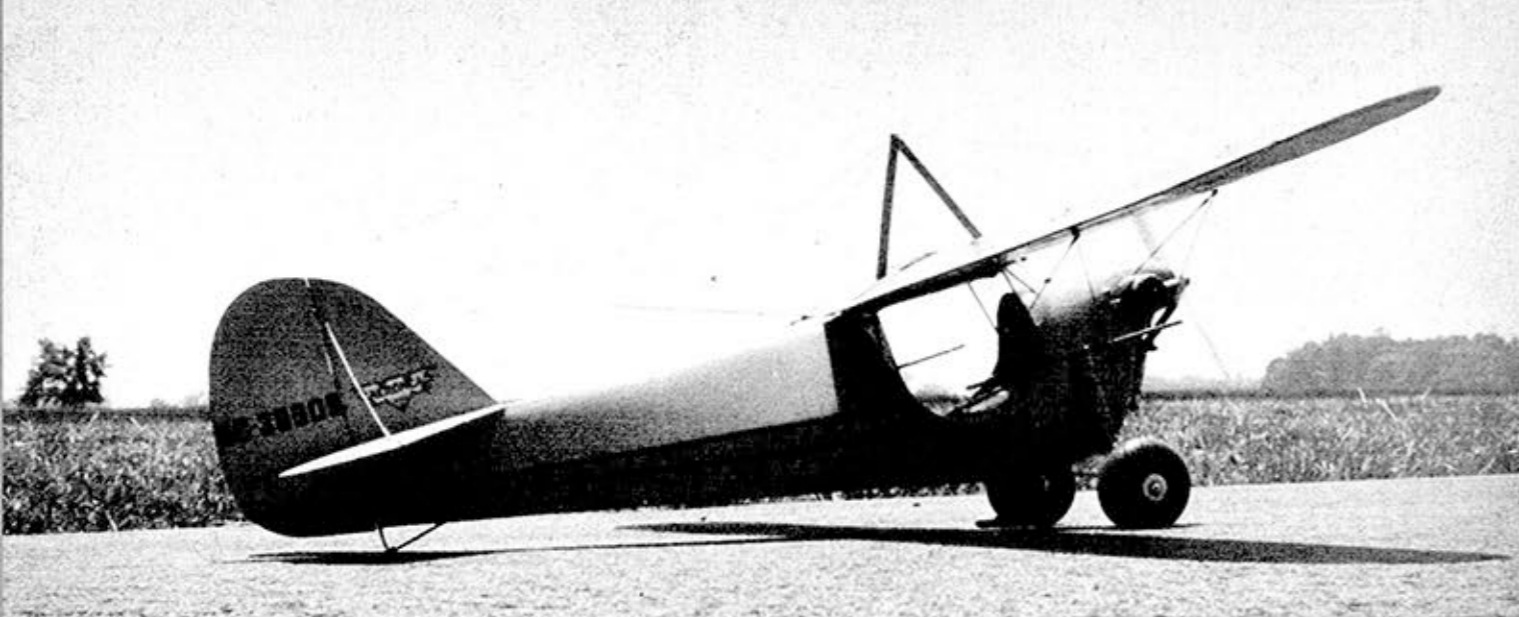


October, 1966 • 50 cents

ICD  
**MODEL  
AIRPLANE  
NEWS**



**Record Setting ROW Free Flight—Save Your Arm—Wild Bill's excellent Primary/Advanced Control Line Trainer—Single-Channel RC Aeronca C-3**



It's our Button Pusher's opinion that if this photo of the C-3 doesn't grab you you're not a scale modeler and should forget the whole thing.



It's claimed that beautiful scale proportions will make beautiful flyers.

## AERONCA C-3

SOMEHOW THE OLD AIR-KNOCKER MANAGES TO MAINTAIN ITS HOLD ON THE IMAGINATION OF OUR SCALE MODELERS.

Other than those fat Trexler wheels, there is little to give our C-3 away as a 54" scale model. Note opposed engine with its exhaust pipe.



Designed By Ralph Fidance  
Text By Bill Northrop

► If there ever was a contest to pick a company-manufactured airplane that looked more like a home-built job than any other, the old "Flying Bathtub," Aeronca C-3, would have won hands down.

Actually, winning such a contest could in no way be considered insulting to the designer and builders of the "Air-Knocker," because the aim was to produce an extremely light-weight and very simple flying machine that wasn't priced out of the working man's reach.

The prototype was built in 1924 by J. A. Roché, an engineer at the Army's McCook Field. The Aeronautical Corporation of America, located in Cincinnati, first produced the 30 hp single seat version known as the C-2. The two seat C-3, starting with the "Razorback" style which is the subject of this construction article, was in production from 1931 to 1936. The 1931 version, the one Ralph has modeled, was a bare minimum airplane. The landing gear was rigid, depending entirely on (Continued on next page)



Our 1½" to the foot scale Aeronca waiting its turn on the runway. Pilot must be out over the side checking on something as he is not in cockpit.

### AERONCA C-3 . . . continued

fat, donut air wheels to absorb shocks. There were no brakes, a simple spring-leaf, fixed tail skid, and only enough engine instruments to tell you whether the putt-putt was hot, cold or indifferent. Flight instrumentation consisted of an altimeter. (Would you believe a weighted clothesline with a knot every five feet?) Price was \$1,730.

The 1935 and '36 model was revised considerably, going to a fully enclosed cabin, single strut shock absorbing gear, and steerable tail wheel. The engine was Aeronca's own 36 hp opposed twin, and this, combined with the ultra-light loading and high aspect ratio wing produced what could be called a powered glider, capable of soaring under favorable conditions.

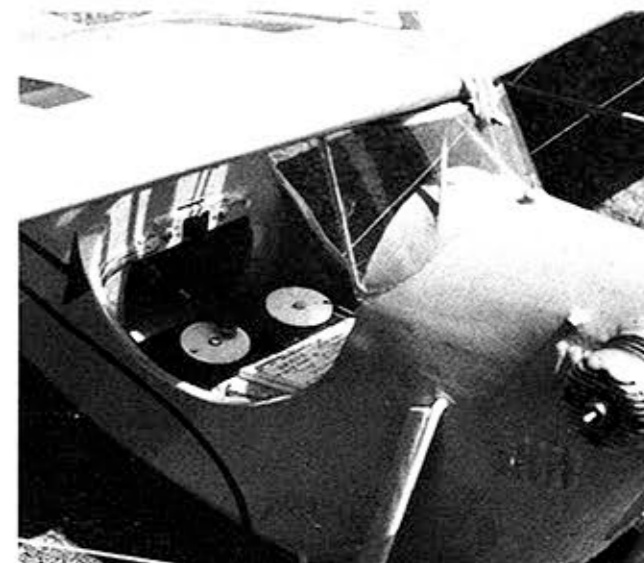
The full scale ship on the cover of this issue is of this latter type and belongs to the owner of Summit Aviation, Inc., Richard C. (Kip) du Pont, Jr., son of the well-known glider pilot. Kip's plane is maintained in operating condition, and not long ago, was flying formation with Tony Wilford's (he's known as the East Coast Orbit Fixer) Fox .59 powered Jenny. The Fox had to be cut down to about half throttle in order to hold the Jenny back to the C-3's flying speed.

Although model builders in the mid-twenties were having most success with twin pushers, it would seem that Mr. Roché must have been thinking of future scale enthusiasts when he cooked up the C-3. A simple, straight forward design, the "Air-Knocker" has a high thrust line, generous tail surfaces, short, stubby nose-overless landing gear, and lots of high aspect ratio wing area.

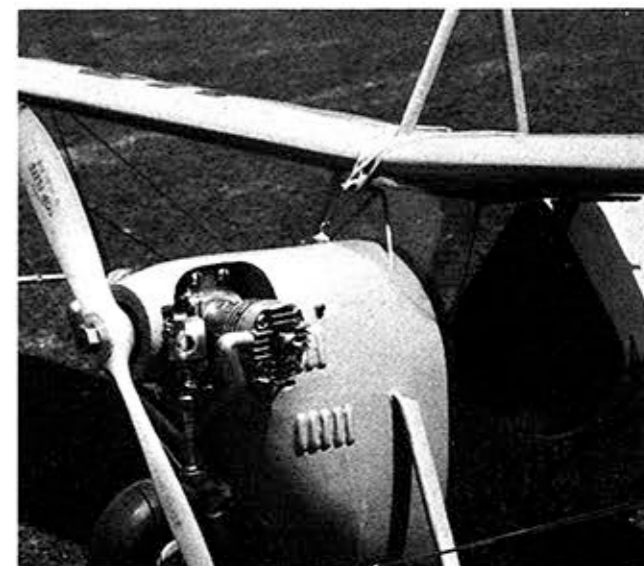
A second glance, however, does uncover a problem in the short nose moment followed immediately by the large open cockpit. First of all, the short nose creates difficulty in maintaining the balance point. Secondly, the short nose also becomes as crowded as a 15-student telephone booth by the time you cram in an engine, tank, and batteries. And thirdly, about 99 per cent of the wing sits over the open cockpit, presenting quite a mounting situation.

Be that as it may, our intrepid single-channel specialist has, with great perseverance (you remember the Great Percy, don't you?) defeated the aforesaid problems and has come up with the cutest R/C scale model to appear in a long time.

Plans are 1½ inch to the foot scale, having been doubled from the famous Cleveland Model ¾ inch scale kit plans. The resulting fuselage is 3½ to 4 (Continued on page 45)



Large, open cockpit is a handy place for motorized actuators and on-off switch. Dummy engine is the head and barrel of a Fox .15 eng.



¼" hardwood dowel exhaust pipe epoxied to engine. Note gas gauge and cooling louvers on cowling. It's the little things that really count!

## Aeronca C-3

(Continued from page 28)

inches wide in the cockpit, and though tapering toward the nose, provides room for batteries and tank ahead of the firewall. The receiver is located in a lidded "foot locker" just behind the firewall, and the Royal single-channel servos take the place of the pilot's seat. (Ouch! That rudder servo smarts!)

Ample power is provided by an .09 Enya R/C, while a Fox .15 cylinder was cut off from its crankcase and epoxied to the opposite side for scale appearance. (Well, you can't win 'em all, Duke.)

Although the original model hefts a little on the heavy side, the generous 330 square inches of wing area with Clark Y airfoil provides plenty of lift, and flights are very scale-like.

If you want a good laugh, you should see the "Air-Knocker," with the Enya in high speed, "taxiing" through grass that is higher than its fat little Trexler wheels. Ground control is superb, even with the one-is-right, two-is-left rudder and fixed tail skid.

This writer has always had a passion for the C-3, probably because of fond memories of a cow pasture air field, lazy summer afternoons flying rubber-powered Megow SES's and Korda Waterfields, and listening to the singing of rigging wires as a little red and silver "Knocker" slipped in and putt-putted out again, making 5-point scores on repeated touch and go's.

Wouldn't it be great to have a 3 inch to the foot model on propo gear with a muffled .60 in the nose so you could hear the wires? After a while you could probably manage a real, genuine sideslip or two and . . . here now, let's get the single-channel boys to work, multi hogs too much of the limelight anyhow.

(Continued on page 48)

## Aeronca C-3

(Continued from page 45)

**Construction:** Tail surfaces are simply 3/32" thick framework with 1/16" sheet covering. They are warp free and sturdy, but can be a little heavy if choice of materials is not watched carefully. If you prefer, the surfaces could be built up of 3/16" framing and covered with light silk or silkspan. Of course, you'll have to watch more carefully for warps with the latter construction, so "ya pays yer money and takes yer cherec."

If elevators are planned, follow the fin and rudder construction method around the spars. Incidentally, don't be afraid of the barn door rudder. With about 3/8" movement each way, the rudder action is just right. Turns are positive but do not cause unscale-like rocking. Steerage while taxiing in grass as we mentioned before, is probably as much due to deflection of the rudder against the "wheat" as it is from the air blast of the prop.

Wing construction is typical rib, spar, sheeting, and cap strip with a few added gimmicks. If you're a fussy builder like Ralph, you'll build the wing tip over the plan, crack the bottom spars where indicated, and jack the tip up an 1/8" before adding the leading edge and top spar. In fact, the mean guy designed the tip ribs such that if you don't do it his way, the leading edge will have to bend down to fit, so you better humor him and do it right.

When installing the center ribs, leave a gap for the cabane strut. After this is epoxied in place, fill in the rest of the gap with scrap balsa and then sheet over with 1/16" balsa to build up to the wing thickness.

In order to retain scale shape, the fuselage construction takes on an unusual pattern. The nose, from bulkhead F-4 forward, is built first. Cut from plywood and assemble F-4, F-3A, F-2A, F-2, and F-3. Insert the hardwood motor bearers and epoxy glue all joints.

The 1/32" ply battery box is built in next, just prior to fitting the balsa nose blocks to each side of F-3A. The blocks must be cut out to fit around the battery box. Since the 3/32" balsa fuselage sides will overlap the nose, these blocks must be routed to receive the sides. An alternate method would be to cut the blocks down an additional 3/32" and extend the sides farther forward. This will require some bending, however.

After fitting the sides and aligning carefully, the rest of the fuselage construction follows more normal procedures: sides are pulled together at tail post, remaining bulkheads are installed, stringers and top longeron are added.

Before blocking in and planking the upper half of the nose, install the 1/8" diameter music wire main strut, which is held in place by the grooved hardwood block. Now the 1-1/2 to 2 oz. tank may be installed. A 1-3/4 oz. Perfect was used in the original, giving 15 minute engine runs.

If a control system and linkage similar to the original model is to be used, the throttle transition lever in its tube bearing should be wire sewed and epoxied in place now.

After making sure the rear wing supports are in place, the rear upper fuselage (razorback) may be sheeted with 3/32 soft balsa.

Several items must be dealt with before closing in the bottom with 1/16" sheet. Plan and assemble control pushrods. Epoxy the wire tail skid and ply support. On the prototype, the skid was pivoted at the front end, and shock was taken by com-

pressing a coil spring on the vertical post. The model used a rigid setup, but if you wish, run the vertical member into a brass tube glued to the tail post. The 1/16" music wire should provide satisfactory spring action.

Final step before covering the bottom is to wire stitch the rear landing gear strut to 1/8" ply and install between F-4 and F-5. At this point, the front strut and flying wire fitting can be wrapped and soldered to the front L.G. support, and then the front, main, and rear struts can be bound and soldered together.

In order to increase strength around the large open cockpit, 3/32" balsa doublers are white glued and clamped inside from F-4 to F-6. In addition to this, fiberglass or Celastic should be applied to the outside of the nose, back to bulkhead F-7.

It's handy to have the wing finished when it comes to bending the main wire saddle, since it must conform to the shape of the wing's under surface. Adding the 1/16" wire windshield supports completes the wire bending job for the center section.

The amount of work and detail around the nose is up to the individual builder. The crankcase cooling fins are pieces of 1/32" ply inserted in saw kerfs made in the nose block. The right side and top of the nose, to ring F-1, is built up of small blocks, sanded down to the ply pieces and then planked over with 3/32" strips.

A cut-out is made in the right side and a dummy cylinder is epoxied in place. To be accurate, this should be slightly behind the left, or operating cylinder.

Coat the entire engine area with a generous layer of epoxy glue to assure complete fuelproofing.

Exhaust stacks are built up of 1/4" dowel and louvres are 1/16 x 1/8 balsa cut to shape, glued in place and edges slightly rounded by sanding.

After epoxying the tail in position, the wire supports may be added. These can be either 1/32" diameter music wire or 125 pound test control line lead-out cable. Be careful not to distort surfaces by tightening these supports. They're only there for looks. The same comment goes for the wing landing wires, which are the ones coming down from the cabane strut over the center section.

The flying wires are more difficult to prepare. These are fabricated from 1/32" music wire, and though the wing has a fairly wide support area over the cabin and the wires are not necessary, the plane just looks awful bare without them. Remove them for first flights, until the ship is trimmed out.

A half size layout of the flying wires is shown on the plans, but since each model will vary slightly, the layout should only be used as a guide. Assemble the wires with the wing in place and when everything is proper (no bows, no bent wing) solder all joints and epoxy the 1/8" dowel in place. All of the wire attachment fittings are bent from regular paperclip wire and epoxied in place before covering and finish are applied.

The original ship used 2 filler coats on the bare wood followed by 2 to 3 coats of clear dope. After covering entire plane with Silron, 5 coats of clear and 4 coats of Cub yellow Kampel dope interspersed with generous portions of sandpaper and elbow grease, were applied. License numbers were cut from black Monokote while the Aeronca insignia was painted on yellow paper, cut out and glued to the rudder. Pinstripe and arrow were painted on with black Kampel butyrate.

Flight tests indicated a need for one washer of right thrust, i.e., a washer between the motor bearer and the rear

mounting lug on each side of the engine. A nylon Top Flite 8 x 4 has been found to best suit this particular combination of engine and airplane. A Cox 8 x 4 will allow more revs if you find the plane is a little sluggish. Again, each ship will vary according to finished weight and engine used.

The C-3 should balance slightly nose down at a point 2-1/4" aft of the leading edge. Make several test glides over the tall grass (or over a six-inch layer of marshmallows if you can't find any grass), leaving off the flying wires for this and first powered flights.

Final trim should provide a gradual climb in high engine, a nice altitude holding cruising speed, and a gradual sink in low. Let's face it, this is a scale model of a minimum performance ultra-light plane, not a gung ho stunter. When you get the C-3 cruising, about 100 feet away, a 100 feet up and the inside wing banked toward you at about a 45 degree angle, you'd have to be a stone hearted, bone head not to feel that tingle of excitement that comes to every genuine modeler when his creation rewards his efforts with moments of sheer realism.