

Plane on the Cover

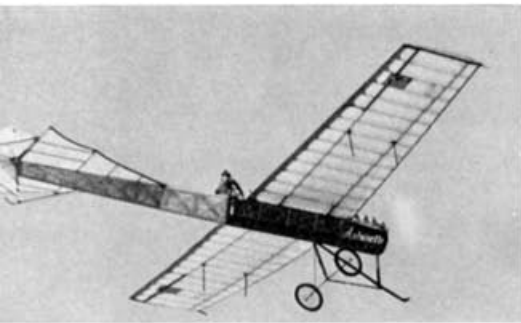


All photos Al Signorino

Antoinette

Big, graceful, and slow characterize this much-loved airplane from aviation's early history. Model has 8-foot wings and weighs 9 pounds, yet flies realistically on only a 36.

VERNON ZUNDEL AND AL SIGNORINO



Magnificently, he flies past at an incredibly slow speed. At times, the Antoinette thinks it's a glider, making it very easy to fly.

THE Antoinette, a lovable ship with nice lines and graceful flight characteristics, was among the greats in early aviation. Named for Antoinette Gastambide, daughter of the company's director, it was a favorite because of its handling characteristics and ease of control. Some said the Antoinette could be flown by a new student after only three or four hours of training. The engine developed for the original was so popular that it was often used for other airplanes of that era.

The designer of the Antoinette, Leon Levassour, was an artist who originally de-

signed boats—as is apparent from the plane's fuselage. (During construction of the model, I was asked what kind of sail-boat had silked sides!) If it had not been for minor problems such as forced landings, the Antoinette might have beaten the Bleriot as the first plane to cross the English Channel. But it did set some records. It was the first plane to reach an altitude of over 500 feet. In 1910 it set a speed record of 48.205 mph (!). It also was one of the first planes to use dihedral in the wings, a concept which was not widely accepted at that time. The Antoinette did have its problems with tab effect, wing trampling, narrow wheel base, etc. But it still became one of the most loved airplanes in aviation history.

With the arrival of pilot Hubert Latham and the addition of trapezoidal ailerons to improve lateral control, the Antoinette's performance improved considerably—even to the point of placing second in the Grand Prix in 1909 and setting an altitude record at Rheims in the Prix de l'Altitude. Told by his doctor that he had only a year to live, Latham decided to live life to its fullest and make the most of his remaining days by flying. As it turned out, he died not of the disease or of a plane crash, but by a berserk rhino on an African safari many years later!

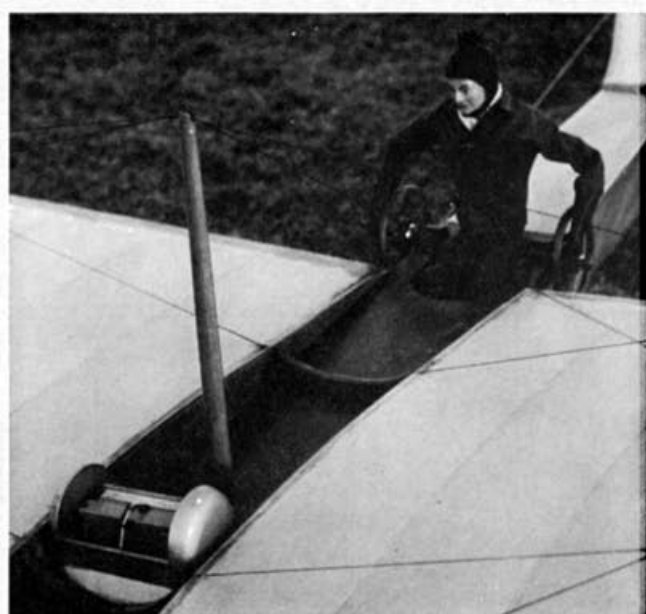
The Antoinette flew again in modern times when it was chosen, because of its unique appearance and size, as one of the airplanes in the film, *Those Magnificent Men In Their Flying Machines*. To us, it was the most

graceful of the old machines, and the idea of an RC version took shape. The 2-in. scale model presented here is adapted from the film ship, since some points of the original left much to be desired with respect to modeling. To build the Antoinette for entry in AMA scale competition, some additional research is recommended. When the exact version to be modeled has been selected, compile proof-of-scale material before beginning construction. The March and April 1965 issues of *Aeromodeller* have 2- and 3-view drawings, photos, and data on all the planes that flew in the movie.

We began construction with a set of 3-views from W. C. Hannan Graphics. The book, *Building Aeroplanes for Those Magnificent Men* (\$2.95 from John W. Caler, 7506 Clybourn, Sun Valley, Calif. 91352) helped immensely in overcoming some of the difficulties encountered in the reproduction of this magnificent machine. In spite of all the reference material, some modifications had to be made to achieve a stable, structurally sound RC plane. The two major changes were a conventional airfoil and a more forward landing gear location. A small amount of lead (one pound) was added to locate the center of gravity at 33% of the chord.

Construction

Construction is fairly simple, but there's lots of it! Rudder, fin, stab and elevator are flat and easily built directly on the full-size plans. The horizontal stabilizer leading edge is made up of two $\frac{1}{8}$ x 2" balsa strips lami-



Intrepid aviator views one real, three fake cylinders (hiding fuel tank), and a real Fox 36RC. Landing gear prevents nose-overs.

Flying wires are functional and must be properly tuned by plucking. Note aileron servo location inside fake gas tank. Frightened pilot!

ated together. The rudder passage is removed after assembly. Upper and lower rudders are joined by a common $\frac{1}{4}$ " sq. piece of spruce. Rather than raise the leading edge eight degrees as on the original, we located the wing flat on top of the fuselage for simplicity, strength and easier mounting. Test flights later proved this to be a valid deviation from scale.

Begin construction of the fuselage by building the top framework directly on the full-size top-view drawing. For a flat building surface of the proper size, try to obtain a reject "second" blank door. It is light, rigid and cheap. The slight nose-down angle for downthrust must be taken into consideration when building the forward fuselage (raise former A $\frac{1}{8}$ " above the surface of the plans). The motor mount plate is later cut to shape, epoxied to the top of the forward fuselage and secured with wood screws. After the framework is completed, install all cross members as shown so warps won't develop. The top $\frac{1}{16}$ " sheeting is recommended for rigidity and alignment, but it will be cut away later in construction.

The bottom longeron is made from $\frac{1}{4}$ " sq. balsa from F-14 to F-7, where it is then spliced to the $\frac{1}{4}$ " sq. spruce longeron. The

two upper longerons are $\frac{1}{4} \times \frac{3}{8}$ " balsa. The formers for the fuselage are made from $\frac{1}{8}$ " balsa, then reinforced with $\frac{1}{8} \times \frac{1}{4}$ " strips. After fuselage assembly is completed, remove the centers as shown, leaving the guides for Nyrods. Install the Nyrods while the fuselage is still upside down on the plans and secure with epoxy at three or four places. If this long a run of Nyrod is secured only at the ends, it will bow in the middle giving spongy control surface forces.

The sides of the aft fuselage are sheathed with $\frac{1}{32}$ " balsa, then cut away as shown before silking. The sides of the forward fuselage are sheathed with $\frac{1}{16}$ " or $\frac{1}{32}$ " balsa and covered with $\frac{1}{16}$ " or $\frac{1}{32}$ " ply veneer back to F-7. Rub a stain into the grain and be sure to rub off any surface excess. Then cover with clear Top-Coat to give a glossy finish. Be sure to overlap the silk with Top-Coat at F-7 to prevent peeling back at this point due to the airstream and oil spray from the engine exhaust. The letters ANTOINETTE are cut from white regular MonoKote and ironed onto the Top-Coat.

The dummy radiators are made up of $\frac{1}{4}$ " ply formers drilled with $\frac{1}{8}$ " holes. Ten $\frac{1}{8}$ " dowel sticks 20" long are inserted, secured with glue, sanded flush on the ends and

painted silver. The completed dummy radiators are held in place by four 4-40 screws mounted to the side of the fuselage.

The dummy crankcase is made from a solid balsa block hollowed and fitted with ends. The exact shape is not important, but it should conceal the fuel tank. Three dummy cylinder heads were added to simulate the four-cylinder upright in-line DeHavilland Gipsy I engine used in the movie version of the Antoinette. (Some of the originals

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Takeoff must be directly into the wind. Acceleration is slow. Large stabilizer helps with excellent pitch stability and control.

Antoinette

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used V-8 engines.) The Fox 36X RC used in our model proved to be an excellent engine. The ship weighed approximately nine pounds, but it lifted off with scale realism.

Make the lower portion of cylinders, which includes the exhaust stack, out of 1/4" balsa. Cement these to the top of the dummy crankcase and fill in underside with Hobby-poxy Stuff. The top sections, made from 3/4" dowel, are then cemented in place. Cut five 3/4" ID rings from 1/16" ply for each cylinder. Cut out the dummy heads from 1/4" plywood. Cement the rings (dummy fins) and heads in place on the dowel rods. Cut 1/16" x 1/8" grooves 1/8" apart the full length of the three heads to simulate the head fins. Trim the heads to shape, cut out for glow plug, drill 1/4" holes and screw the glow plugs into the plywood. (They will form their own threads.) Paint the entire dummy engine silver. Make the dummy exhaust pipes from 1/4" dowel rods and epoxy to the sides of the three dummy cylinders.

Referring to the photos and drawings will aid in understanding the above instructions. Cut out the hatch plate and cover with Top-Coat. The dummy engine and crankcase are then fitted and secured to the hatch plate with epoxy. It must fit in place over the fuel tank, so the fuel tank, throttle servo and throttle linkage should have been installed previously. After trial-and-error fitting and trimming are complete, secure in place with four small wood screws. Fuel line was used to simulate hoses from the aft end of the dummy crankcase to the forward end of the radiators.

Handwheels are made from 1/4" ply in one

piece and rounded to shape. Use a 3/4" dowel for handwheel supports. Drill for 1/8" shaft, then cut into two parts at the bottom edge of the 1/8" hole and cement in place.

The pilot is a modified GI Joe doll with a painted set of goggles and an old green stretch sock for a flying cap. Run a small bead of cement around the face from forehead down the sides to the chin, pull over the sock, secure it with rubber bands and let dry. Then, with an X-acto knife, cut away a hole for the face. The tassel was made from a strip of green wool rolled into a lump and cemented to the head. Attach goggles and the head is complete. Cement a roll of Manila paper (see plans for flat pattern) around the wrists and forearms. Paint hands and paper gloss black.

The wheels are handmade as follows. Draw lines as plans indicate on 1/4" plywood. Drill holes for spokes and axles. Cut out wheel and cut away the four center sections. Install axle bushing and check alignment. Permanently attach four spokes on each side, using 60-40 solder. Remove wood "X" center section, being careful not to disturb bushing or spokes. Install remaining spokes on both sides and epoxy at wood rim. Add 1/4" balsa outer rings to both sides and clamp in place with spring-type clothes pins until dry. Insert 1/8" x 3 1/2" bolt through bushing and secure with a nut. Chuck into a hand drill or lathe and, while turning, sand edges of wheel to shape. Stay clear of spokes! Finish area around spokes by hand. Scribe outer surface to simulate tire tread by using a pointed ice pick, jeweler's file, or scribe, etc. Apply three coats of black dope to tire and paint rim silver.

Only the right wing panel is shown, so build it first, then turn plans over and build the left panel on the back. Join the panels with the joiners and, when dry, attach to rectangular plywood attachment plate with epoxy and four wood screws. The wing will seem flimsy. It will be stronger after silked and doped, but flying wires are required, or else up to 90 degrees of dihedral will develop in each panel! The wing spikes are made by tapering dowel rods, or brush handles can be used. These are keyed together inside the wing, as shown, and must be securely anchored because the wing flying wires are attached to them.

Four coats of clear dope were used on all silk surfaces to keep down weight and to provide a high-gloss finish. The wing tips are made up of a 3/32" balsa rib covered with a 1/16" ply wing-tip skid rib and then a flat tip of 1/4" balsa, rounded on the edges. The aileron servo is hidden and protected from castor-oil spray by the scale dummy gas tank, plans are sufficiently detailed for making it. The completed assembly must be securely attached to the wing center plate with epoxy and wood screws. Wing rigging wires are not just for looks; they are required to keep the wing tips from touching each other above the fuselage after take-off! Rigging wire tension can be checked by "plunking" and listening—the tighter it is, the higher pitched the note. (Tune for approximately middle C!) Use tough lightweight black lines or medium dial cord, and prestretch if necessary before installation. In the pit area, point the nose directly into wind and listen to the constantly changing tune.

Engine Choice: The engine can be any 45 to 60 or a Fox 36X or the new Fox 40. Since weight is needed in the nose, a 60 can be used and throttled back after takeoff for realistic flight. We chose the Fox 36X for the prototype for several reasons: to prove that the Fox 36X could fly a nine-lb. plane; to obtain approximately scale power for realism; and to use a small engine so that when the three dummy cylinders were added it would look like the upright 4 cylinder in-line engine used in the movie version of the Antoinette. Missile Mist fuel and

a 10-6 prop were used to get plenty of rpm at the top end. The engine was set up for a low, quiet idle, and a fast throttle servo was used. By "burping" the throttle from full closed to full open to full closed on the landing approach, it sounded somewhat like cutting the original's mags on and off!

Radio: A Bonner 4RS was used for all flights on the Antoinette. Full-house controls seemed necessary since at times aileron control would be desirable even if the ship flew OK with just rudder and elevator. (Those with Bonner 4RS systems probably know that Digimite took over the repair service when Bonner dropped out of RC. Now, however, Larson Electronics, 2289 S. Grand Ave., Santa Ana, Calif. 92705, has the Bonner repair and manufacturing facilities.) The Larson 5RS is an improved version of the 4RS and is available with either updated 4RS servos or Orbit type servos. The dummy gas tank shown on the plans is designed to house the 4RS servo and should be modified as required for other types.

Test Flight: The first test flight of the Antoinette again proved the importance of keeping the CG well forward! Initially, the CG was at 40%, and pitch control was difficult, since there wasn't enough pitch stability. The tail and aft fuselage should be kept light and lead added to the nose to get the CG about 33% back from the leading edge. Use downthrust and set the wing and stab level on the fuselage top, as shown on the plans. The first flight then should present no difficulty.

First flights should be made in reasonably calm weather with takeoff directly into the wind. Hold some up-elevator as power is slowly applied. It will track well and lift off gently. Smoothly let off most of the up-elevator, continue climbout, make a 360-degree turn around the field and come back over the transmitter, heading directly into the wind. Check hands-off trim and correct if necessary; cut throttle to idle and check glide. Make a traffic pattern approach with final directly into the wind. As the ship goes by, the wind will be playing a tune on the flying wires. Start pulling in up-elevator, so that full up is held just as the wheels touch! The slow, shallow, stable glide and slow landing speed of this model make it more like a glider than a scale or pattern ship.

This is the fourth in a series of vintage scale projects by Vern Zundel, who designs and builds the models. When asked how he manages eight original scratch-built scale projects in one year, his only answer so far has been, "I spend most of my spare time on it!" Vern is the originator, promoter and motivating force behind the 60th Anniversary London to Paris Air Race to be held in St. Louis on Sept. 27th. Al Signorino's part in these vintage aircraft projects has been to make the test/trim flights and to do the black and white photography.

They generally make movies of the project test flights, because something unexpected usually occurs. These movies, on regular 8 mm film, are available for a \$5 rental fee to anyone interested in seeing them. Included are the Blackburn, Bristol Brownie, Demoiselle, Antoinette, DH-2, DR-I, RC Autogiro, Snoopy's RC Doghouse, etc. After September 27th, movies of the 60th Anniversary Air Race will also be included. Contact Al Signorino, 11959 Glenvalley Dr., Bridgeton, Mo. 63043 or call 314-739-3456. 3456.

The Sixtieth Anniversary Air Race is limited to RC models of aircraft that flew or theoretically could have flown in the actual or movie version of the 1910 Air Race. This includes aircraft designed and flight-tested, even if unsuccessfully, prior to 1911. Models may be to any scale in size and may be scale or semi-scale in appearance. Proof-of-scale is not required, however, the Proctor Antic kit is about the limit. Operating models of any pre-1911 unsuccessful ma-

chine may be entered. The model need not fly, but it should act like the original.

The object of the race is not maximum speed. Entrants must qualify by successfully completing two takeoffs and landings and two heats of five laps each, without a forced landing in the "English Channel" during the second five laps. Final placings will be determined by a random selection of a scale speed after all have flown the course. Forced landings will be allowed since they were common in 1910. One exception is that a forced landing in the English Channel (not really water, in this case) during the five laps from Manchester to Paris will be considered an unsuccessful attempt.

The first air race heat will start at 2 pm, Sept. 27, 1970, Buder Park, St. Louis, Mo. Details are available from Contest Director Al Signorino.