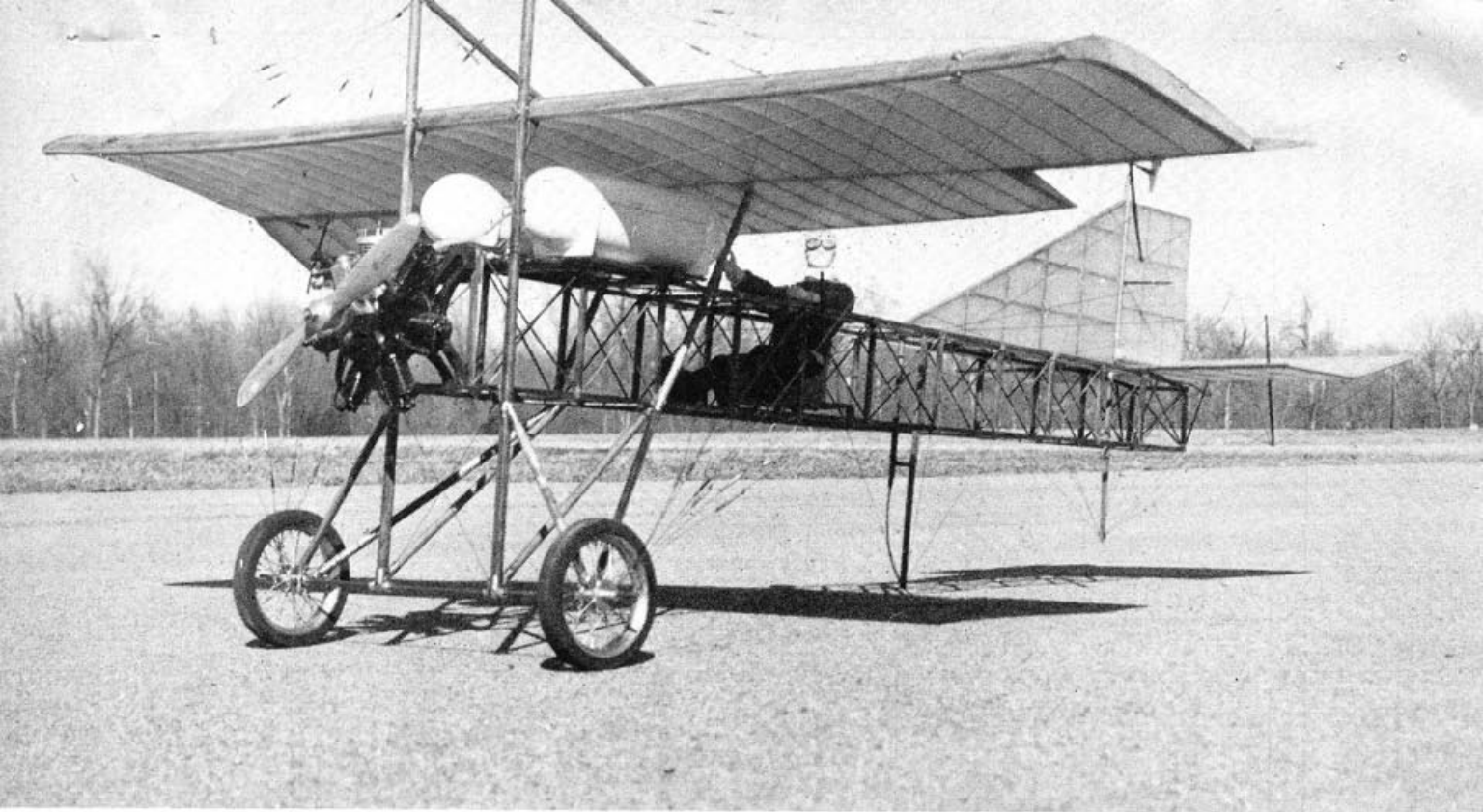




Photos by the Author

1910 Henri Farman

by Vern Zundel

**Transparent wings spread 47-inches to loft
this fragile antique bird gently upward from the thrust of an
Enya .45 cleverly disguised in the nose.**

Indian Summer fades away and Fall gives way to Winter. It is a signal to return to the workbench. In search of an interesting project for the cold months ahead I came upon a layout of the 1910 "Henri Farman" in my reference file. It caught my eye right off, a real stick and tissue type, not too unlike the structure of models we used to build twenty-odd years ago. The peanut sized drawing was by W.C. Hannon Graphics of Escondido, California 92025. It inspired me to think in terms of a 2" scale Stand-Off R/C, which would have been a poor subject many years ago. When we had nothing more than one-tube radio systems, ignition mills and scant experience, it would have been but a dream. Today however, we have such foolproof systems and know-how, we can make almost anything fly, and very successfully. I consider this ancient aircraft to be not a bad or even a poor design. I found it to have clean lines, an interesting planform and a nostalgic appearance overall. Structurally,

it's a very easy flying machine to build as it's almost entirely square in line, except perhaps for the trailing edge. It does have some drawbacks of course. The short nose moment requires careful building at the tail section to achieve proper balance. A little weight will be required at the engine location to acquire the proper C.G.

The outer lines of the aircraft are as close to true scale as data permits, and only the most important changes were made internally to assure a sound design. As with any intricate model, care in building will be rewarded upon the flying field. Choose your materials for strength and weight accordingly.

To give you a short history on this aircraft, it was designed and built in 1910 by Henri Farman in France. Power was a seven cylinder Gnome engine mounted on the front of the prop. (See Jane's 1911 Aircraft, page 400; Monoplanes and Biplanes, 1911, pages 254-256; The Aeroplanes Speaks, pages 1918.) Wingspan was

23.5 feet, the chord 6.5 and the ailerons were positioned in the rear of the wing tips. The basic fuselage was triangular, with the tail mounted on the fuselage triangular fin. Total weight was 661 pounds, including the pilot. Length measured 26 and a fraction feet. Spoked wheels for the forward gear and a skid aft. The propeller was a two bladed Chauviere tractor, which hauled it along at an unknown rate of air-speed. Steering was accomplished with an elevator at the rear and a rudder above the aft surface. A special feature of the design was the position of the main plane and the early use of ailerons. So much for the historical side, sparse as it is.

The Model's Construction

Before attempting to start this project, you must consider the type of R/C gear to be used. Lay out enough area in the dummy gas tanks for all the R/C equipment, including a six ounce clunk type tank. When all is fully installed there will be no visi-



Above and left: We cringe in terror at the very thought of climbing into such a thing, and we wonder where they got the courage? It was easy, you

have got to realize they weren't climbing into an antique pile of wooden bones, but the most modern flying machine man's mind had ever invented.

ble means of control and it will bring a flood of inquiries as to where the equipment is and how it works.

I chose to use a Bonner 4RS receiver with a World Engines S-4B servos and a 500 mil battery pack. If your system is anything larger than what I used, you will have to modify slightly, or design your dummy tanks to suit. The dummy gas tanks are held in place with four small wood screws at the corners, permitting removal for servicing radio equipment etc. without tearing up the structure.

On the original model, I used cables to the ailerons and I was uncertain as to how they were going to work. I do not recommend this method of control on the ailerons and I believe torque rods would be better and aerodynamically safer. Keep these suggestions in mind when placing your servos and check the direction of movement of each. I would like to say at this time that this R/C replica flew off the board with virtually no trim changes at all, which was more than could be said of the full scale 1910 prototype. I had an aged Enya .45 aboard the plane which was far past its prime as far as power goes, but it was well suited to this antique configuration, lifting it off in a very realistic manner. Old engines can often find useful days in aircraft which demand less than the all-out new engine thrust demanded by competitive types.

I suggest you keep the rudder movement down to a small amount, as it is very effective and over-control will be your downfall on takeoffs. Ground handling is on the critical side. This ship utilizes a short aspect ratio wing and it requires more than the usual degree of aileron movement to

give scale-like turns. This was taken into consideration when building and it worked out just right, so follow the suggested layout on the prints. A reminder at this point about the plane. It's not designed to fly an F.A.I. pattern, but rather it is a special event kind of Sunday machine for an experienced flier. A calm day is in order when test flying until you gain a degree of familiarity with the control response.

We had to design our dummy engine with the use of Williams Brothers 2" cylinder heads, and used this area to hide the necessary weight (about one pound) inside. This was done by cutting up used tire weights, and setting them in hidden places with Devcon 5 minute epoxy.

The fuselage structure is made up of $\frac{3}{16}$ " square spruce, joined by inserting a $\frac{3}{8}$ " length of $\frac{1}{16}$ " dia. dowel at each joint. I used Titebond glue for the entire building of the airplane. Due to the amount of $\frac{1}{16}$ " dia. dowel cross-pieces, I found it to be to my advantage to purchase a number of bags of Q-tips with the wooden ends (about 7" long). These are epoxied at each joint.

The engine mounting plate is made from $\frac{1}{4}$ " plywood, with the holes cut out. A Tatone mount with an adaptor plate behind it (cut from $\frac{1}{4}$ " ply) works well. Shave it at a $2\frac{1}{2}$ degree angle for the thrust setting. ($\frac{1}{4}$ " thick tapering to 0".)

The pilot's seat is fabricated from $\frac{1}{16}$ " ply for the bottom and $\frac{1}{32}$ " for the backrest. You may have noticed the slight slope on the rear of the fuselage top. This is warped in while building the sides, and left to dry overnight. All the struts are created from $\frac{1}{2}$ " dia. dowels for the two front ones and $\frac{1}{16}$ " dia. for the back set.

They are placed with epoxy and small wood screws. Make sure this installation is correct and that the axle is at a right angle to the fuselage so ground tracking is straight. The axle is of $\frac{5}{32}$ " dia. music wire. Wheels are 5" diameter spoked types. The entire axle assembly is kept in place with $\frac{5}{32}$ " wheel collars.

Flying wires are attached to the axle assembly, using Perfect #226 line connectors on soldered lugs. All the forward flying wires are thin control line cable with turnbuckles. Make them secure! The rear cables are made from thin nylon fishing line to save weight. Keep in mind that this is a hopped up Free-Flight and any weight saved could make the difference in how it's going to handle later.

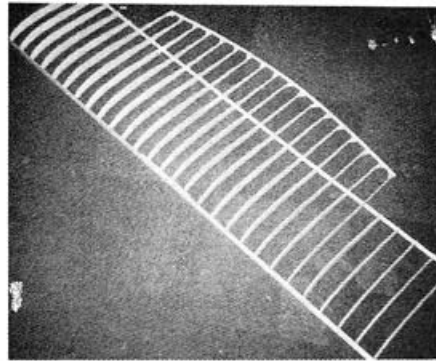
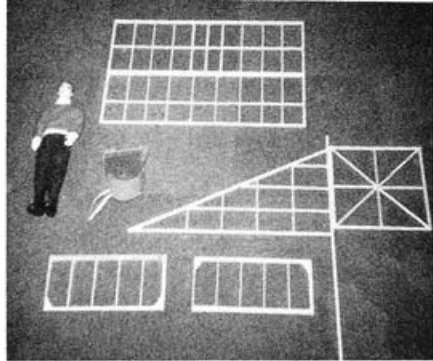
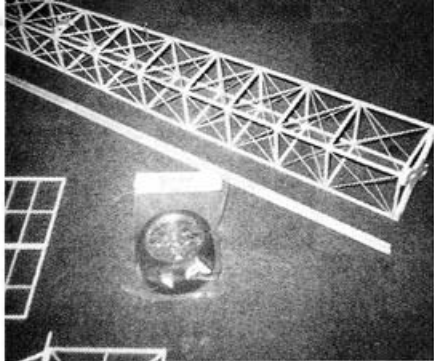
Install the two dummy $\frac{1}{8}$ " plywood plates for gas tank supports and epoxy in place. The tail skid is simple, but adequate.

For obvious reasons you can see why the central rigging post is made of spruce. The fin and rudder are formed of $\frac{3}{16}$ " light balsa and rounded on the edges. Keep them light. The horizontal stab is built in a manner similar to the rudder.

There is no way that I found that I could make a shock mounted landing gear, so landings must be done with a degree of precision.

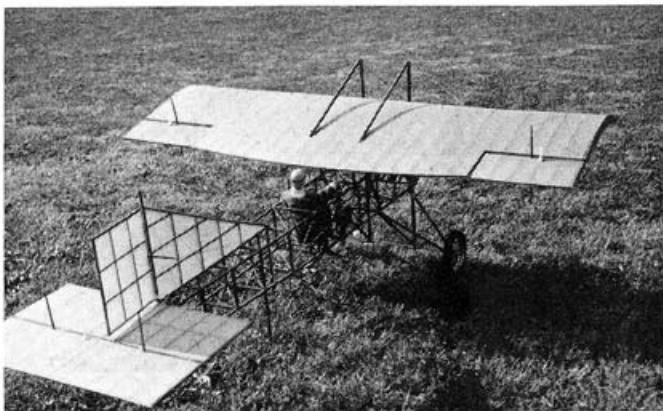
The wing is short in span and simple in nature. No dihedral is employed. To prevent warps in the wing when covering, leave the trailing edge of the aileron and the trailing edge of the wing attached together and cut free after the flying wires are installed. Do not pull the rear wires too tight, as this will also cause warps.

The wing is attached with two 4-40 bolts in the front and two 2-56 bolts in the rear.



The fuselage takes shape. Fun times building the trusswork. Easily done. **Top center:** Simplicity in lines. It made building easier back in 1910. **Below:** All together now, your knees and framework can tremble together.

Wing structure is straight-forward. Undercamber causes no big problems. **Below:** Sun streaming through. You can appreciate your efforts in flight. It brings aviation's history closer to your mind. A magnificent machine.



The blind nuts are epoxied to a $\frac{1}{4}$ " ply doubler at the leading edge. The rear 2-56 nuts are mounted in a $\frac{1}{8}$ " ply gusset. The flying wires are attached by $\frac{1}{4}$ " dia. dowels which they pass through.

We stained the fuselage with a walnut color and covered this with a coat of poly-urathane varnish. Cut the varnish so it will not lump up. The tail surfaces and the wing were covered with gold silk and then clear doped. The two dummy gas tanks were painted white with K&B Super Epoxy.

For additional information on scale detailing you can write to W.C. Hannan, Box A, Escondido, California and for 35¢ you can get a three-view and proof of scale.

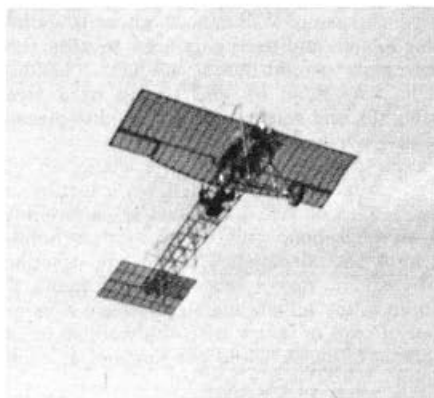
The trailing edge of the wing must be warped 24 hours prior to building the wing. This covers all the necessary points you need to know in order to build this "Henri Farman" without trying to outguess the designer. It will be necessary however to watch the plans carefully to avoid errors.

My original hung around the shop for almost six months before I built up enough courage to fly it. Knowing my own flying limitations when it comes to testing a year's building effort, I thought it wise to place it in the hands of a skilled man for the test flight. Bob Underwood of the GSMA offered his help. We took it to Buder airfield and with joy in our hearts proceeded to make all assembled modelers break out in laughter. Background comments followed the vein of "I told Wilber and I told Orville, it will never get off the ground!"

The venerable old engine had me worried I'll admit, but with patience and the right airscrew it lumbered across the field and lifted airborne on ancient wings. Slow

and true, flat off the deck. Beautiful to see and extremely realistic. The giggling and fun remarks turned to cheers at the sight. So worth the months of effort.

It's flight was smooth, the turns graceful and according to Bob it was gentle in response. The landing was accomplished with about half throttle setting and it descended down in a power-on glide. Down



onto the runway without so much as a bounce. It takes a good pilot to fly them like that.

With the cost of materials today, this is about the least expensive Scale type plane to build. The major cost was in the dummy cylinder heads. The wheels and the rest can be salvaged from most scrap boxes.

The reason I chose gold silk was because it blended well with the fuselage and it was the only silk I had on hand. I had no

information as to what color the prototype had been, but I believe it must have been a natural finish.

With this undercambered wing it would be advisable to select a day when the wind is down to about 5 miles per hour to attempt the first flight. Once you have seen yours take to the wing you will be surprised at how rewarding the endeavor is. You end up with a Stand-Off contest ship and a Sunday flying machine as well. One nice feature about this one is that it is the smallest 2" scale antique type in my collection.

Maybe a word here on the pilot is in order. It will take a little modifying to lighten him up. As a flight surgeon, consider him overweight. I removed his arms and legs, replacing them with a comparable mass of sponge rubber. Further, I cut lightening holes in the rest of the torso, leaving only head and hands intact. The G.I. Joe doll went on a diet to say the very least. Balance is critical, so watch the grams aft of the C.G.

To conclude, I would like to state that this project was a real ball to build, not too time consuming and relatively inexpensive to complete. It did not require a massive amount of tools, beyond the usual hobby hand tools commonly found in the modeler's collection. With the advance of electric motors we may find that we can eliminate all the weight of fuel proofing in these old-time types, gain the proper C.G. without the dead weight of lead and end up with a quieter, cleaner airframe. Something to strive for.

And to those who are going to build this aircraft, I wish you the best of luck and a fine flying season. It will help you recall the days of old.