Snyder-McReady Baby Bomber

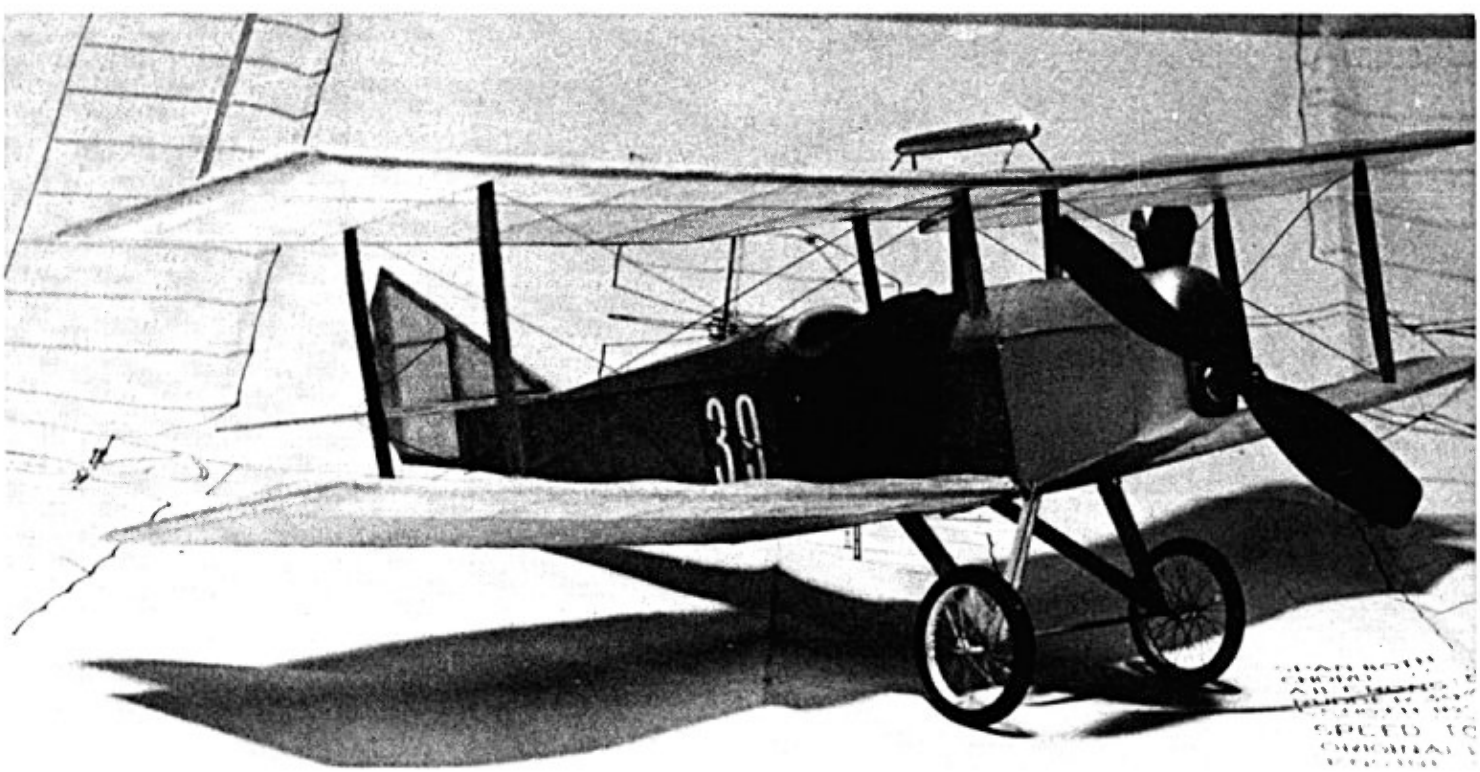
It makes a neat little Scale CO_2 design. Full size fold-out plan to build on. A fun bird indoors or out/**Joe Johnson**

TEXT AND PHOTOGRAPHY: DOC MATHEWS

The "Baby Bomber" was developed by O. H. Snyder beginning in 1921. Powered by a two cylinder, fifteen horsepower Indian motorcycle engine, it was one of the few practical and proven designs available to the home builder in the early 1920's.[1] One should remember that no Federal regulatory body even existed until the 1930's to dictate the safety of design and materials used in aviation. Consequently, many homebuilt designs existed but precious few were flyable and/or safe.

The "Baby Bomber" spanned twenty one feet seven inches, had a three foot nine inch chord, and weighed a whopping 314 pounds empty and only 500 pounds full. Needless to say, pilot weight was critical with only 176 pounds available in useful load including fuel. A problem similar to the experience of Doug Bianchi and his Santos Dumont Demoiselle reproduction made for "Those Magnificent Men" arose when the reproduction refused to leave the ground until someone discovered that Santos Dumont weighed only 110 pounds dripping wet! Joan Hughes, a petite lady pilot, was hired and the Demoiselle flew quite nicely as the movie demonstrated.[2]

The use of a converted motorcycle engine was not novel to the "Baby Bomber"



Full-size plan on foldout

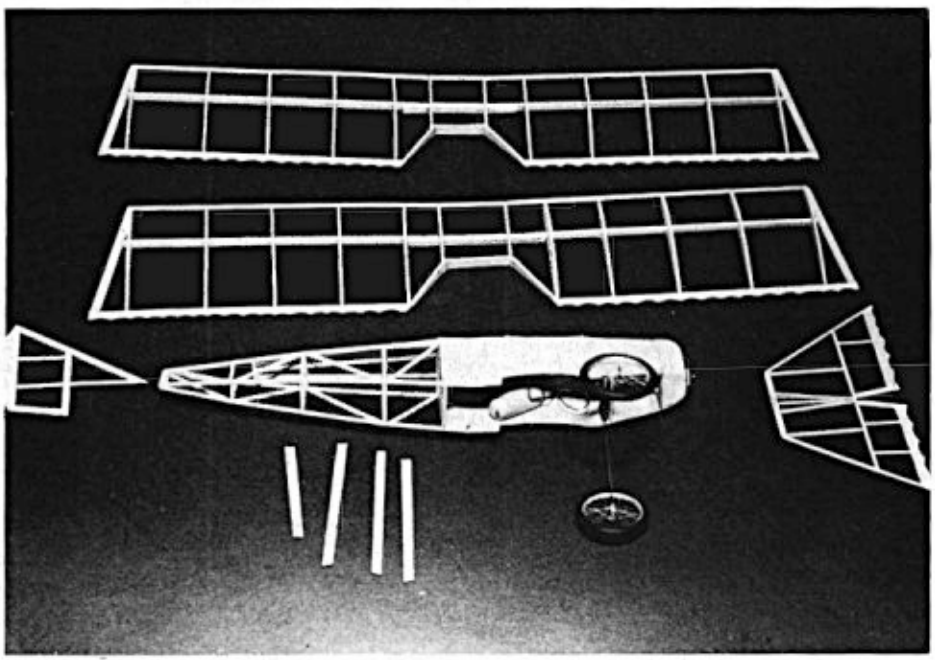
although it was one of the few successful applications. The drive shaft was placed towards the tail, driving a reducing gear on the prop shaft which ran in journals below the engine. The normal 2500 r.p.m. was reduced to 1200 r.p.m. and drove a left hand prop. The Indian Chief displaced 71 cubic inches and was gravity fueled from a tank mounted over the upper wing center-section.

No information exists to my limited knowledge concerning color and markings. The photo in "The Lightplane Since 1909" appears to reproduce a dark fuselage color, lighter wings, and a silver or white engine area. The number "39" on the fuselage sides are shown on Gordon Coddings drawings and presumably were placed when the aircraft was entered in the 1924 Dayton Air Races. Of course no "N" numbers were placed as no C.A.A. existed.

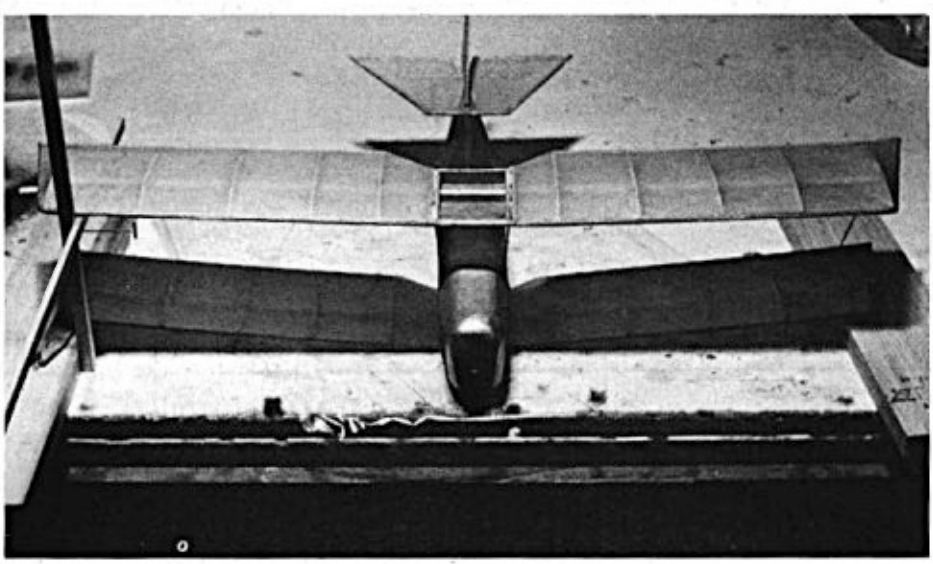
I had purchased a set of 1/12th drawings from Gordon Codding[3] many years ago with the intent to someday develop a Free-Flight Scale model from them. When Joe began considering a replacement for his much flown Farman Sport, he commented on the previously mentioned photo in "Light-planes" and I recalled the long ignored drawings. A hasty ruler application revealed an ideally proportioned bipe for CO_2 could be developed by using a .8 factor. As a consequence, the model is in 8/10th inch to the foot scale, a little strange granted, but a simple scale ruler can be developed for competition use by following the instructions in the A.M.A. rule book.

The resultant model is of considerable eye appeal, and also flies exceptionally well. Frankly, CO_2 power is simply great for fun type flying. A model of this size will fit in a box from the grocery store, can be carried in the smallest of sub-compact cars, and requires only the charger in the pocket and the model in the hand. Playgrounds and even empty lots provide sufficient flying space. No one complains of noise (there isn't any) and operation is so clean one can fly in his business suit and tie if so inclined.

After watching several modelers fly these powerplants and reflecting back on my personal experiences in the early 1950's, I am convinced that these little CO_2 powerplants are the wave of the future for fun flying. This concept is going to sweep the model world with as big a splash as Peanut Scale has. If you question my enthusiasm you simply have not tried CO_2 yet. This little model is a great place for you to start, so let's build one!



The top and bottom wings are identical, one less complication in your life. Note the scalloped trailing edge, typical of early aircraft. Nothing difficult to frame out on this aircraft, it's a relaxing ship to build. The CO-2 cartridge tank can be seen within the lower fuselage. **Photo below:** Assembly requires a little attention to alignment, wing setting. Note how wing incidence is checked out. It's important.



General Construction Notes

All the balsa sheet used in this project is light but firm 1/16" sheet Contest grade. Basswood is available to your hobby dealer from Rev Model Products and/or model railroad suppliers. The wheel can be ordered from Peck Polymers, Box 2498, La Mesa, California 92041. Cyano Acrylate (Hot Stuff, etc.) is exceptionally handy on models of this size. Never mark anything on this model with a ball point pen, the finish will only cover over light pencil marks.

The Fuselage

Make yourself a "kit" by cutting all parts out before assembly is begun. Trace the patterns from the plan onto typing paper or tracing paper, cut out to rough size, then spray lightly with Sprayment or such. Stick onto sheet (watch grain direction) and carefully cut to correct outline. Drill holes for motor mount and tubing.

Two identical fuselage sides are built one over the other using Saran Wrap as a separator. When finished, gently pop apart with a table knife. Mark a left and right side with pencil for cabane strut reference lines. Pin fuselage keel directly over plan, position A-B and C using a triangle to assure parallelism, then Hot Stuff to place.

The two sides can now be placed and Hot Stuffed to the keel and bulkheads. Pull the tail posts together using the top view as a guide. Hot Stuff tail posts then add 1/16" sq. cross members. Remove assembly from plan, add A-A through E, 1/16" sq. stringers; install engine, tank, and card stock cowl (do not cut out cockpit until later). The tank can be Hot Stuffed to the fuselage side reaching in from the uncovered bottom. Bend landing gear to outline on the plan, place onto the 1/32" ply former, wrapping with carpet thread and then Sig Bond. Do not install! Build up cowl around the engine at this point.

The card stock is just old ordinary 5x4 recipe card or debator note cards. It Hot Stuffs beautifully to place. The engine cowl is made with 1/8" x 1/4" balsa strip built up around the engine. A piece of 1/4" sheet is cut to clear engine top, then the 1/4" sheet nose block is drilled to clear the "timer" and shaft, and Hot Stuffed to the strip frame. Use a sanding block to fair into fuselage. The whole process takes only a few minutes. Remember that you don't need to be concerned with fuel proofing or cooling.

The Empanage

Use conventional sticks and pieces construction throughout, just keep it flat and light. Scallops can be easily done using 220 paper wrapped around a 1/2" inch dia. dowel;

start at the edges and work toward the center.

Wing Construction

Upper and lower wings are identical. Dihedral is sanded in using the classic sanding block against the table edge technique.

Covering Notes

There are so many dissimilar products presently available all under the name "Japanese Tissue" it is difficult to say "cover with Japanese tissue". Use what you have or can find. The frame should be coated with two or three coats of *nitrate* dope, covered dry, then very lightly moistened with water. Pin down emphanage while shrinking. Joe used three coats of nitrate thinned half and half to seal the tissue. No gloss is needed. Cut out cockpit using pattern drawn in pencil.

Cover and dope everything but the fuselage forward bottom and the upper wing center-section top before final assembly. The nose was brush painted with silver butyrate, but Floquil mixed with nitrate will also work. The interplane and cabane struts were stained with furniture stain (Gold Star Fruitwood). Don't forget the holes for the rigging. The undercarriage should be doped after assembly. Hot Stuff the stabilizer and rudder to the fuselage.

Mark the cabane struts with pencil at their entry point into the wing and where they will clear the 1/16" sheet top; this mark must be on the inside for reference. Cut appropriate slots through card stock, push 1/32" ply through, adjust mark to just clear the 1/16" sheet top, and make sure they are straight up and down refering to marks. Hot Stuff to place. See photo for wing jig and lower wing positioning. Install bottom wing with Sig Bond. Install top wing using pencil marks for guide where the cabanes enter bottom of ribs. Carefully adjust for parallel as viewed from top. Be sure wings are level with each other when viewed from the front. When satisfied, Sig Bond cabanes into space between double ribs of top wing.

Allow everything to set, then remove from jig. Sig Bond the landing gear into fuselage, cover and dope bottom of fuselage and top of upper wing center-section. Install interplane struts, then Hot Stuff to place. Complete by constructing the 1/32" bass landing gear frame in place on the fuselage bottom. The wire is not attached to the basswood, it is allowed to swing free preventing breakage but still giving a realistic appearance. The tailskid is cut of basswood and Hot Stuffed to the cross and side members of the fuselage.

The interplane rigging is monofilament fishing line threaded through the small holes (1/32" or less) previously drilled into the struts. Tie a knot in one end, thread through both holes, tighten, and Hot Stuff. These lines should be tightened only enough to remove sag, they are not functional, only decorative, as are the Williams Brothers cylinders and the balsa fuel tank.

Preflight

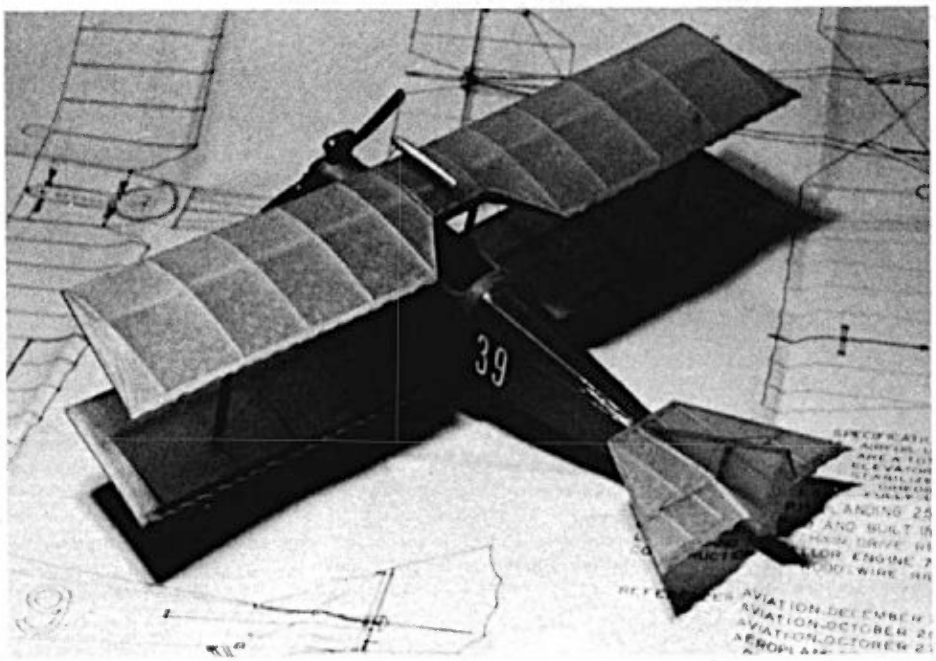
Use weight as needed to make model balance fore and aft when held at the spar of top wing. Once again as with his Farman Sport, Joe needed no ballast at all on the prototype model. Steam out any warps, rather unlikely, but check.

Hand glide to check for any severe stall or turn tendency. Correct with elevator or rudder. Set motor for half speed, "fire up", and hand launch the model; it should barely climb with a slight left turn. Increase to ¾ power to obtain a sweeping left hand turn as the model climbs. It may be necessary to use engine thrust adjustments (use washers) to prevent a right turn or power stall. Under no circumstance allow this model to turn right under power! The prototype had a slight power stall on the first flight. Since the cowl would have to be cut to add down thrust, Joe put a "tweek" of additional left rudder in. The second and all subsequent flights have been absolutely delightful. A full liquid charge gives a 30-45 second flight usually terminating with the engine still ticking over. At this size and weight, Joe hasn't been bothered with much of a glide and that's not all bad! As delightfully cute as this "Baby Bomber" is, and as consistantly well as it flies who wants it to thermal?

For just a few dollars and a couple of evenings of effort you can have as much fun as we are. Join in!

Reference Sources:

1: Underwood and Collinge, "The Lightplane Since 1909", (Heritage Press), Box 167, Glendale, Calif. 91209.
2: Allen Wheeler, "Building Aeroplanes For 'Those Magnificent Men' ", G. T. Foulis and Co. Ltd., 1-5 Portpool Lane, EC1, London, England.
3: Gordon Codding Plans, 3724 John L. Ave., Kingman, Arizona 86401.



1920 homebuilts kind of naturally reflected WW-I state of the art. If you're friends think you've got an obscure old fighter there, let them live on in fear. The design is actually pretty well proportioned for scale flight, purrs around quite nicely on a Telco or similar CO-2 engine. They start with a single flip and produce nothing louder than a soft whisper, fine for nearby local ballpark sized flying sites.