

BOWLUS BABY ALBATROSS

By Col. BOB THACKER

One of the best known aircraft of any era, the Baby Albatross has been modeled many times, but we'll bet there has never been a better scale reproduction than the one presented herein. PHOTOS BY TAYLOR COLLINS



● Col. Bob Thacker, USAF (Ret.), is a guy who exudes confidence. He walked into MODEL BUILDER's office one day last winter and announced in no uncertain terms that he was going to build an R/C Baby Bowlus and win scale at the 1975 Soaring Nationals. No doubt it was with the same assurance that he told his Air Force superiors in 1947 that he was going to overload a P-82 ("Twin Mustang") with enough fuel to fly it, non-stop, from Honolulu across the Pacific and across the USA, and land in New York, to establish 3 world records. In both cases, he proved himself correct.

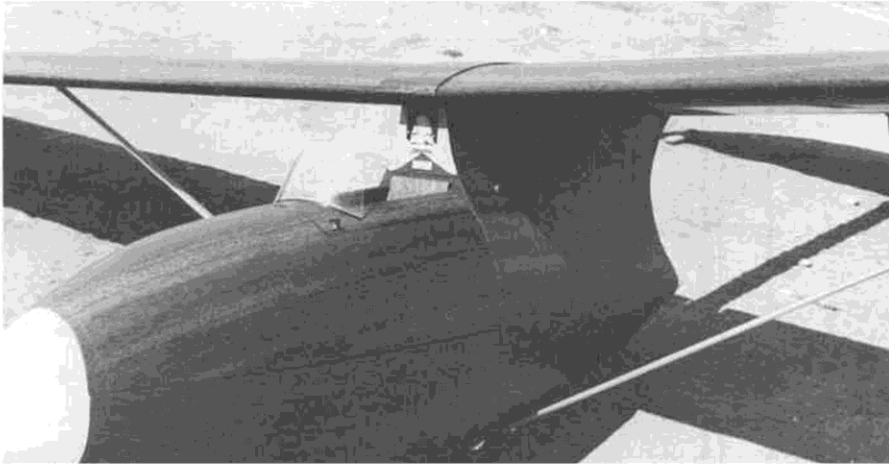
Having dealt with the Col. in other matters, we didn't question his prediction on the Bowlus, but simply said, "Fine, we'll do a construction article on it and time it to come out within a few weeks after the SOAR Nats."

Easier said than done. We're sure Col. Bob had better plans for his non-stop hop than he did for the Bowlus . . . in fact, most anything would have been better than the mutilated, hole punched,

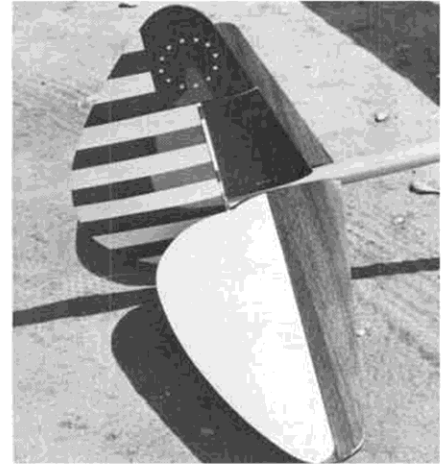
Mission accomplished! Col. Bob Thacker, left, collects first place Scale trophy at the 1975 Soaring Nationals. CD Dan Pruss congratulates Bob while Linda Porter passes the hardware.



The practically non-existent dihedral presents no problems, since the model has rudder and aileron controls. By coupling them electronically, the turns come out beautifully coordinated.



All of the mahogany planking on the original Bowlus was duplicated by using mahogany-finished Contact paper. Struts are K&S streamline tubing, reinforced with music wire.



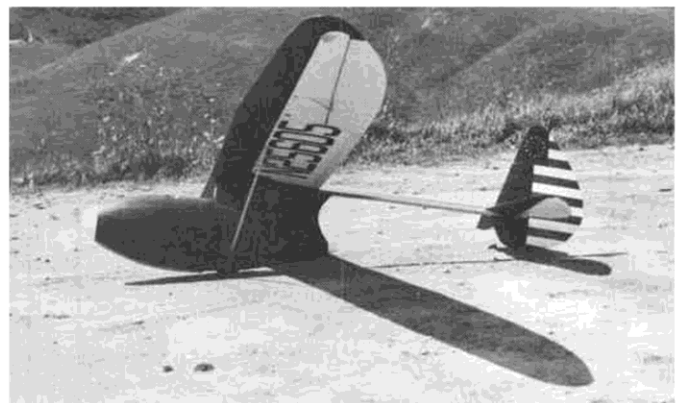
All curved trailing edges are formed from wire. Stab is all-moving, with horn in the sub-fin.



Taken the day of the first test flights, this photo proves that Bob was fairly pleased with the results. Actually, the only change required was to move the balance point aft a half inch. Ship has over 1400 square inches of wing area.



Test fitting the basic structure. The tail boom is made from a one inch diameter aluminum tube towel rack.



One of the most famous profiles in aviation, the epitome of pod-and-boom construction. Note the huge aileron area.



Fuselage planking is applied in small strips due to the compound curves involved. Note familiar modeler's equipment . . . a Band-Aid!



"There I was, on my back at 5,000 feet, with the rudder jammed in full up . . ." Watch what you're doing, Bob, the epoxy's setting up!

ing were accompanied by a huge round of applause.

Except for that, it was all just as Col. Bob Thacker had expected.

Bill Northrop

Hawley Bowlus was one of the premier glider designers and builders in the 20's and 30's. The Baby Albatross was introduced as a homebuilt kit, which could be purchased (and paid for) in ten installments. Bowlus, being not only a clever designer, but a clever businessman, saw to it that the most critical parts of the glider, namely the castings that held the structure together, were a part of the last of the parts packages. There was no cheating . . . you had to buy the whole shebang to get into the air. Approximately 50 were built prior to World War II, and there are seventeen still flying today.

The forty-four foot six inch floater would be no match for the super soarers of today. Its three pound wing loading

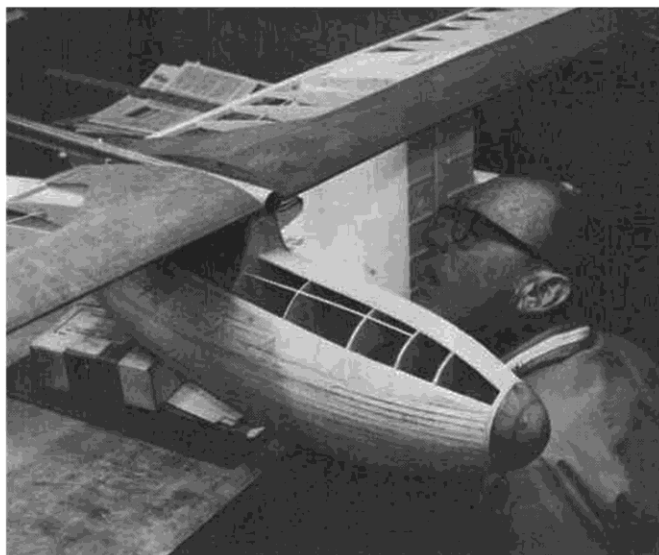
was designed for the leisure pursuit of flight duration, rather than a mad dash from point to point, as the big birds do today. Top speed on the Bowlus was 65 mph. A Gottingen 525 Modified airfoil carried its 450 pounds (complete with pilot). Huge ailerons, and an all-flying fin, helped turn the Bowlus' shallow dihedral (3°) wing.

The pod was made of mahogany sheeting which was held to the plywood bulkheads with sheet metal screws. The wing was of a wooden structure, with mahogany leading edge sheeting, and wire trailing edges. Tail surfaces were constructed in the same manner as the wing. The tail boom was a constant diameter, 5 inch duraluminum tube.

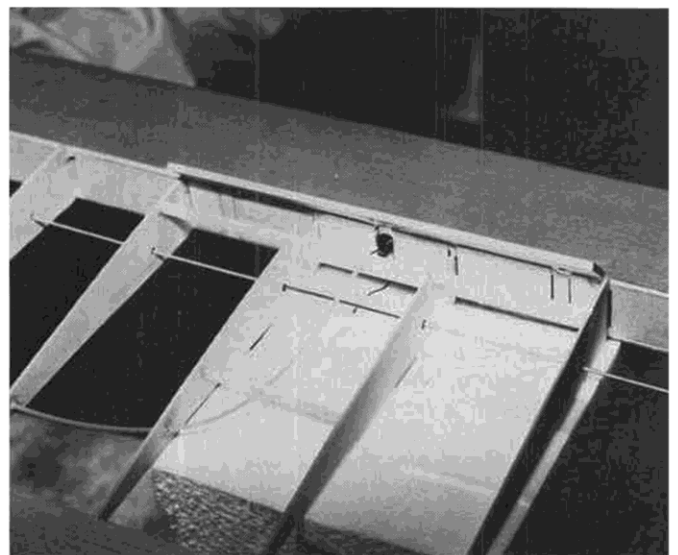
After experimenting with several scales, I settled on 2-3/4 inch to the foot. This gives me enough wing area (1400 sq. in.) to carry the six servos that I felt necessary to control the bird. Wingspan is 122 inches, with an eleven inch chord. This is a manageable size to

transport, yet is large enough to be very impressive.

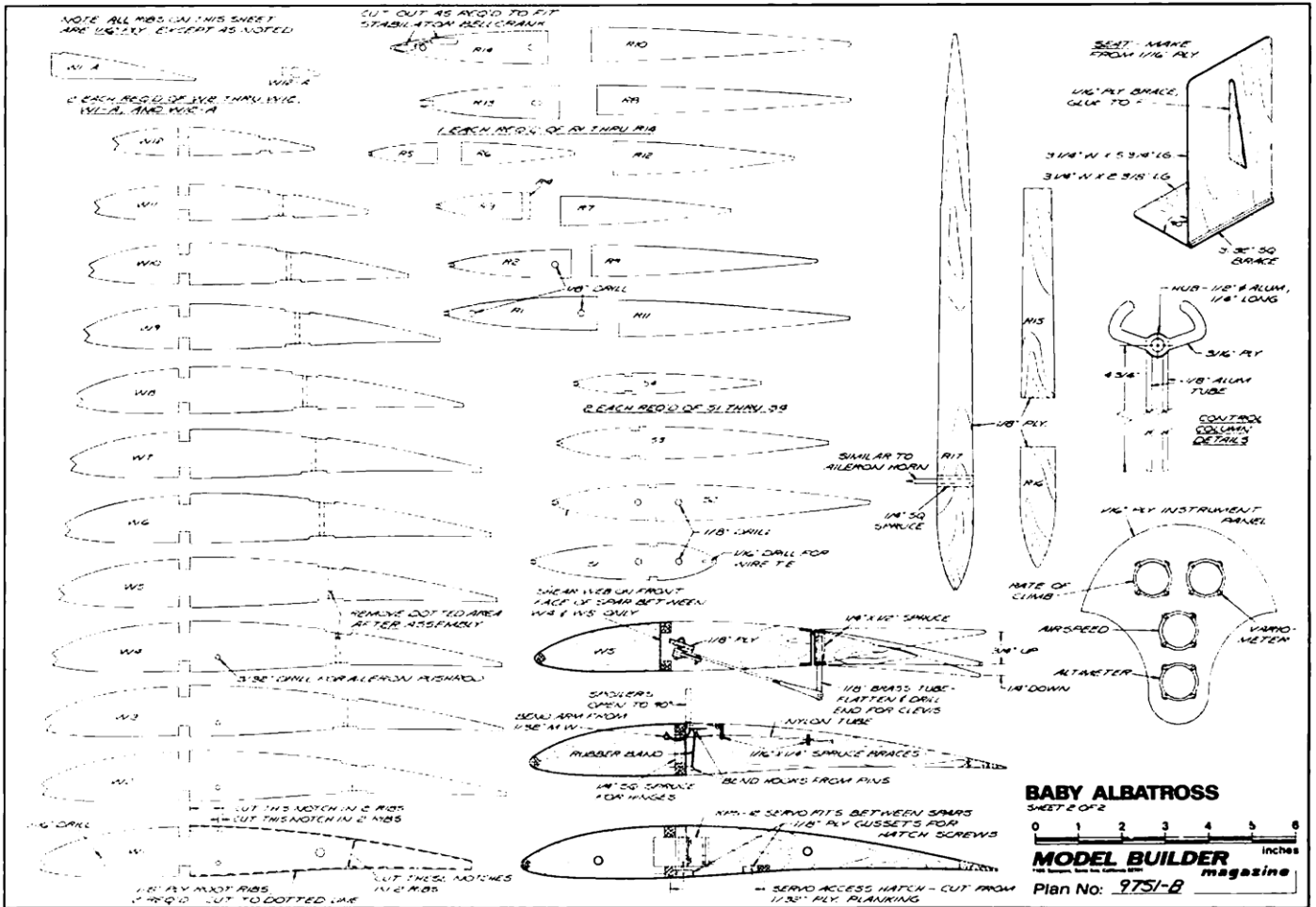
To begin construction, first gather the materials that you'll need. The most difficult thing for me to find was the aluminum boom. I miscalculated the diameter initially, and based on the wrong measurement, was forced to pay \$22.00 for a piece of precision aircraft aluminum tubing. Later, I discovered that 1 inch diameter was correct for scale, and found an aluminum towel rack tube at a plumbing shop for \$1.80. (Anyone who needs some 1-1/16 inch aluminum tubing, please contact me . . . have I got a deal for YOU!) There is very little balsa involved in the construction. All ribs and bulkheads are plywood. The spars are spruce, with 1/64 ply shear webs. I used Sig medium weight fiberglass cloth for covering the pod. Also, get a roll of Contact brand mahogany finish vinyl shelf paper. This is the material I used to simulate the scarfed mahogany sheeting on the monocoque



Planking almost completed. Radio hatch is cut out after pod has been sanded to shape. Real cockpit hatch was too small for accessibility.



Close-up of spoiler rigging. Spring tension keeps spoiler retracted, and servo pulls dial cord to extend the spoiler doors.



pod and flying surfaces.

Wing construction is fairly standard, except for the plywood ribs. Begin by cutting out all of the ribs. The bottom 1/4 square spruce spar is then pinned down and the root rib is pinned in place. Next, glue on the shear web for the first bay, and then the second rib. By proceeding towards the tip in this fashion, you are guaranteed of a good fit between the ribs and shear webs. After all ribs

and shear webs are in place glue down the top spar, making sure that the spar is seated firmly in the rib notches. The Nyrod tubing for the spoilers can now be snaked through the holes in the ribs and epoxied at each rib. Glue the 1/4 inch square leading edge into the rib notches. The 1/32 mahogany veneer leading edges can now be glued in place, after the leading edge has been sanded to shape.

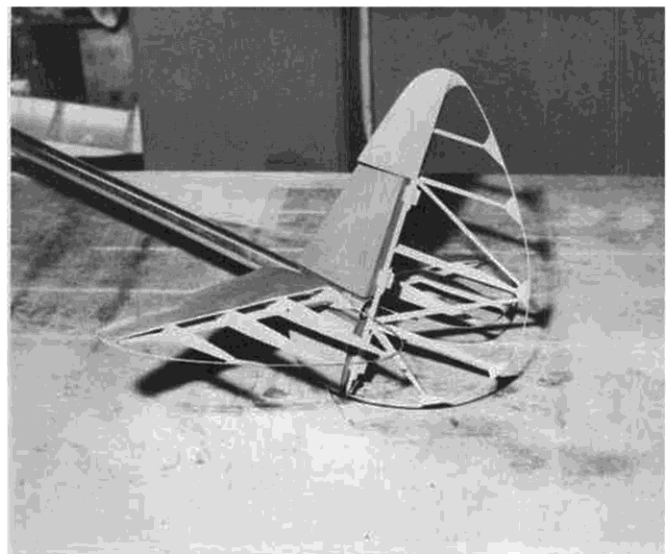
The tail surfaces are built in the same manner, except that 1/64 plywood is used.

The wire trailing edges are held in place with epoxy. Vinyl electricians tape can be used as a "mold" to get a "welded" appearance on the joints. The tape is wrapped around the joint after the epoxy is applied. When the epoxy cures, remove the tape and you should have a

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Tail surfaces are entirely demountable. These wires hold the upper fin in place. Elevator horn is in the sub-fin.



Gussets are realistic, and also help to keep the outline wire epoxied to the stab and rudder ribs. Structure is rugged yet not too heavy.

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neat, smooth, joint. If you should drop the wing and break the joints loose, they can be repaired with Super Glue, Hot Stuff, Zap, or one of the other cyanoacrylate miracle glues.

The pod is built up on a spruce crutch. When the formers are in place on the crutch, you can begin planking. The bottom 2 inches of the pod is planked with 1/8 spruce, to give some strength and prevent damage on landings. The remainder of the pod is planked with strips of 1/8 by 3/16 inch balsa. Work slowly and you'll get a smooth, good fitting job. When the planking is finished, sand the pod to get smooth contours and then apply the fiberglass cloth and resin. I used resin over the cloth on the outside, and resin by itself on the inside of the pod for strength. When the resin has cured, lightly sand it to remove the fuzzies, and you are ready to begin the covering.

The vinyl material is cut to shape to simulate the actual seam lines between mahogany panels on the original. Overlap the pieces of vinyl about 1/8 inch to prevent the vinyl from shrinking away from the seams. I pre-shrunk the vinyl with a heat gun while it was still in place on its backing sheet.

I stained the mahogany sheeting on the wings, prior to gluing it in place, in hopes that the mahogany would show through the silk and dope. Unfortunately, after covering, the mahogany took on an ugly mottled appearance. As a result, I used the vinyl material over the silk to get a scale effect. To achieve a realistic doped linen effect, I used four coats of thinned out white lacquer over the doped silk. This gave a dead white color to the open structure sections of the wings and tail surfaces, which is very realistic. The rudder was trimmed with red and blue Super Monokote. The stars were cut from an American flag decal obtained at an auto parts store.

All control rigging is hidden within the structure. To secure the Nyrod tubing inside the tail boom, tie a long string to a ball of kitchen sponge slightly larger than the diameter of the aluminum boom. Soak the sponge in resin and then work it into place at the rear end of the boom with an arrow shaft and the string. Repeat with another sponge ball at the front of the boom. When the resin cures, the tubes will be firmly locked in place. To get a small, neat connection to the flying stab control horn, stiffen the brass cable with solder. When the solder has cooled, make a "Z" bend in the end, and hook it to the nylon control horn. This will enable a solid connection in the narrow confines of the sub-rudder.

Six servos are used to control the Bowlus. One in each wing operates the ailerons. One is used for elevator, and another, coupled into the aileron channel, is used for rudder. A fifth servo controls the dive-brakes, while the sixth is connected to the wheel brake. Most radio manufacturers will make up a three-way extension cord to allow operating three servos from one receiver channel. I have exercised this system, operating four servos continuously for thirty minutes, and have used only 1/3 capacity of my 500 ma battery pack.

The wing struts are functional . . . as a result, stock K&S streamline tubing is not strong enough. I reinforced the tubing by using a length of 1/8 music wire alongside a length of 3/32 music wire. This combination is epoxied inside the pear shaped tube. Ram a two inch length of hardwood into each end of the tube, and cut the ends to the appropriate angles to meet the fuselage and wing smoothly. Then thread a 4-40 machine screw through the strut ends to attach the struts.

Set up the ailerons with maximum differential. I have approximately 3/4 inch up travel and 1/4 inch down travel. Use maximum rudder travel. This is limited by the cutout in the stab. Use a minimal amount of elevator movement. The tail moment is quite short, and a lot of elevator travel is not necessary. Due to the large stab, the Bowlus is quite stable in the pitch mode . . . if it is left alone.

The C.G. is at 34-1/2% . . . which was achieved with 12 ounces of nose-weight. I use two towhooks, one on each side of the pod, to eliminate problems in towing a glider with such a deep fuselage. The hooks are positioned on the centerline of the fuselage pod, on a line angled 60° through the C.G. of the wing. I tow the model with a five foot long bridle attached to a conventional winch line or high-start.

I enlisted Bill Northrop to launch the Bowlus on its maiden flight. All it took was a firm shove, slightly nose down, off the side of our slope soaring hill. The Baby flew fine . . . although at that time it was slightly more nose heavy than it is now. Since that time, I have both high-started and winched the Bowlus without any problems. It soars at a realistic speed and the turns have to be seen to be believed. The coupled aileron and rudder crank the bird around most realistically.

Since I was a teenager in 1937 I've had a running love affair with Baby Bowlus, and at long last I've got her . . . I'm finally able to ride the ridges and hunt the elusive thermal. ●