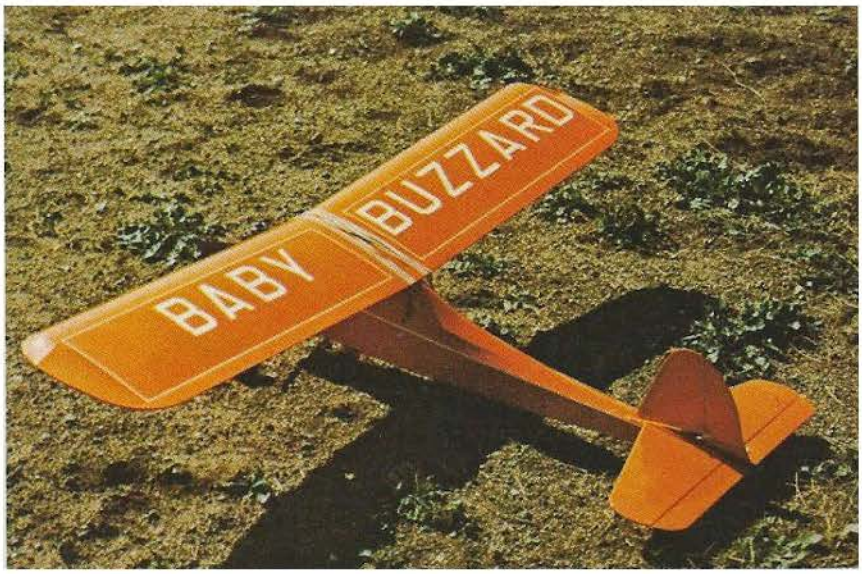
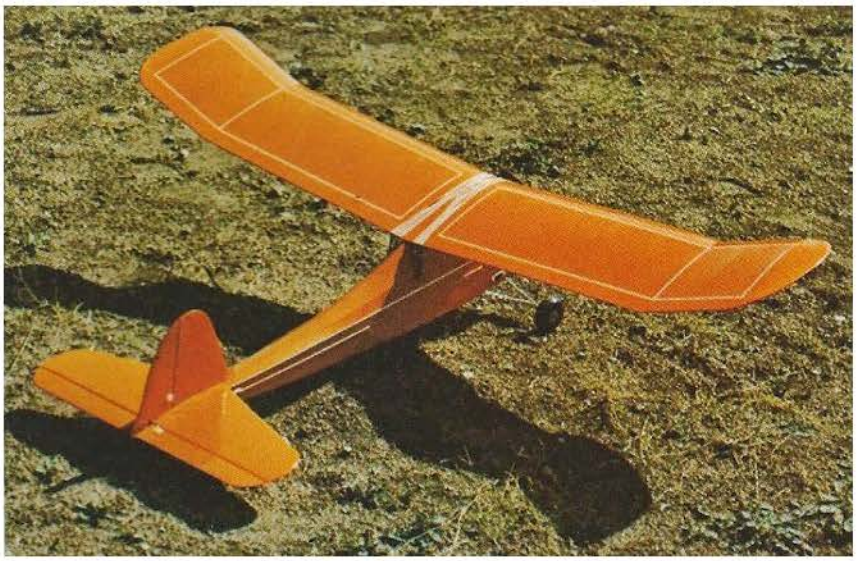
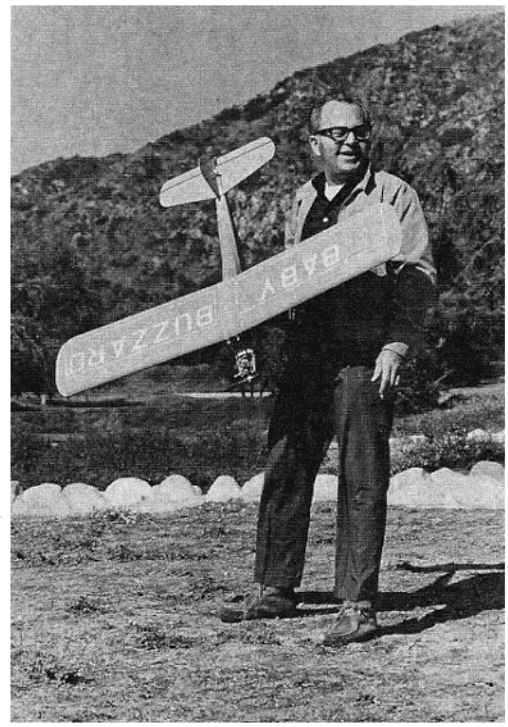


BY ART HEMLER



PHOTOS BY DON DEWEY

BABY BUZZARD



RCM's Dick Kidd tried out Art Hemler's prototype of this scaled down old-timer and found out you can get twenty minute flights on two ounces of fuel.

● How do you convert a glider guy to flying power?

It's easy! Just get RCM's Bill O'Brien to let him fly his Buzzard Bombshell! That's what happened to this hard-nosed glider jockey, who wouldn't be caught dead near one of those oil chuckers. I was at least enjoying some of the feeling of free flight with my gliders, even if I did resort to the terrible sin of radio to bring it home again. But an engine . . . Ugh!

After handing back the transmitter, fact is, I could hardly wait to get my hands on the February 1973 issue of RCM and reread Bob Harrah's article on the Buzzard and its history. After acquiring a set of plans, I proceeded to build my own. Talk about flying for fun! I'd spend all day Sunday flying and come home dead tired (that good kind of tired you get after flying all day). Twenty minutes of flying from a two ounce tank and an OS Max .35 is nothing to sneeze at these days! The Buzzard cruises at 1/8 throttle. You only open it to climb. Operating expense is at a minimum.

Well, somehow I acquired an Enya .09 RC engine. What to do with it? Why not scale down the Bombshell to accept it? Two thirds scale should be about right, giving me about a 48" span. Why, I could haul that in the VW.

The prototype came out quite tail heavy due to careless use of the wrong weight balsa in the wrong places. The required weight necessary to balance the airplane seemed wasteful to me. It was flown anyway, with a 2 oz. tank, Kraft two channel brick and the throttle wired open. I thought that 2 oz. tank would never run out! For six minutes it was nothing but up, circling ever upward. From now on I would only use half a tank.

Then came the glide, and what a glide! Just like her big sister. In fact, it was just like the Amigo, and that Amigo had a glide. Heavy or not, it took fifteen minutes to touchdown and I know I rushed it in the nervousness of that first flight. (Even now the glider guys ask me to go up and find out where the thermals are.)

Two more Baby's were constructed with careful consideration to keeping the tail light. An OS Max .15 was used but this time with throttle servo. Now I could fly as low and as slow as I ever cared to with the niceties of the most completely docile airplane available. I could taxi back to the flight line, forget about that walk back to the Hi-Start, and enjoy the same pleasure that I had received from soaring.

The comments and questions that I receive at the field indicate that all modelers are starting to feel the pinch of the energy crisis. Some supplies are getting harder to buy, spruce and balsa, for example. Others are beginning to cost more. So why not start thinking smaller, building smaller? The Baby Buzzard is one way to go without sacrificing excellent flying quality. You probably have enough in your scrap box to carry a long way into the construction of the Baby.

FUSELAGE

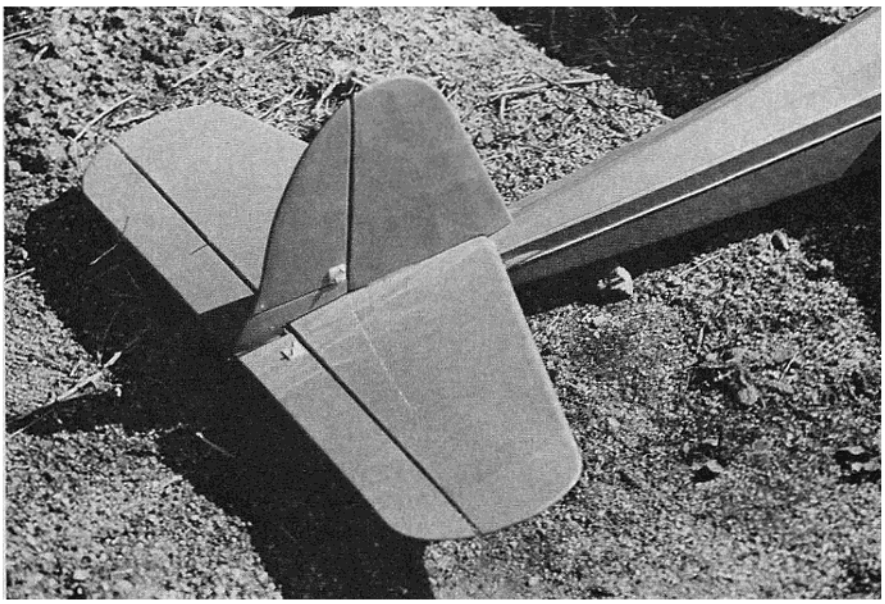
Sides are cut from medium weight 3/32" sheet balsa making certain that both are of equal hardness and bendability.

Mark the locations of the bulkheads on the inboard sides and cement 1/8" square uprights into place. Cut and install 1/8" hard balsa doublers at the forward end with 5 minute epoxy (white glue would warp here).

Make bulkheads F1 through F3 of 1/8" ply. Cement plywood doublers to F2 and F3 (epoxy). Drill 1/16" holes for landing gear lacing at this time. Locate and install the engine mount blind nuts in F1 and an extra blind nut somewhat lower for balancing weight later.

It would be a good idea to purchase a fuel tank at this point so that 3/32" holes may be located and drilled for fuel and vent lines. In fact, it would be nice to have your engine at this time also, so that the height of the needle valve might be measured. How many times have we been reminded by Clarence Lee that the centerline of the fuel tank should be exactly 3/8" below the c/l of the needle valve? Let's help that engine all we can, in other words, reciprocate . . . .

Now the easiest way to assemble the fuselage is to pin the right side down to your plan, right side flat to



the side view. Then epoxy F2, 3, and 4 to their respective locations using blocks to hold them vertical while drying. When dry, simply apply epoxy to the left side of the formers and rest the left fuselage side on top. Weight it down with that coffee cup. It's too close to your elbow, anyway.

Square the left side with the one under it by using your transmitter, fuel can, or anything you can reach in a hurry, just so it's square with the world before that epoxy starts to harden. When dry, shift the entire assembly over to the plan view and pin it down at the cabin section. Run out to the clothesline and borrow a clothespin and temporarily clamp the two sides together at the tail end. Do not cement yet.

Make formers F5 to F8 of 1/8" or 3/32" scrap balsa and cement into place. Install the turtledeck stringers at this time. Use two lengths of 1/8" square rather than 1/8" x 1/4", they will flex better and maintain a nice graceful line.

The installation of the firewall requires great care in alignment and some firm clamping. I clamped the fuselage sides in a vise, nose down until dry. Use plywood for protection against the vise jaws. Eyeball the holes through the aft formers for your outer NyRods. Push a small rat-tail file through the balsa formers and slip the tubes into position, then epoxy. Try to keep the tubes as straight as possible. The elevator exit is not too critical, but the rudder control should exit just forward of the stab leading edge and slightly left of the fin.

Form the landing gear of 1/8" wire. Bind and solder in the conventional way while held to the fuselage with clothespins. Clean off the flux with acetone and sew the assembly to formers F2 and F3 with a good strong button and carpet thread. Then brush on a coat of 5 minute epoxy to fuel proof the stitches.

Install the fuel tank and plumbing through the firewall. Fit the throttle servo (I use mock-up dummies made of scrap wood), and eyeball a hole through the firewall for throttle linkage. (I don't drill a hole in the tank, dummy!)

Fabricate a sub-former of plywood to fit over the tank and epoxy into position. Notch it to clear the throttle linkage.

Now comes the hardest part, the cabin sides. The compound curve is most readily handled by wetting the

balsa in hot water. First trace a paper pattern right off the airplane. Include the line at the rear of former F5, the horizontal line at the top of the existing fuselage side and the vertical line at the forward edge of the firewall. Allow 1/4" extra at the top of the wing saddle. Do not cut the side windows at this time. Mark them for later reference. Now simply transfer the pattern to soft 3/32" sheet balsa and cut to shape. Make a vertical cut at the windshield attach line to facilitate bending over the nose section.

Soak the panels in hot water (never mind that ammonia jazz) and rubber band over the structure until dry. When dry, simply remove, cement and pin them back on.

Assemble the steerable tail wheel unit and cement into place. Run a few 1/8" diagonal braces across the fuselage from F5 on back. If you don't, then the tail will twist when you lift it by the stab tip later on.

The side window openings can now be carefully cut using a fresh X-Acto blade. The hardest part is over.

Plank the underside crossgrain using either 3/32" soft or 1/16" medium balsa. Cut and pre-drill 1/2" balsa block at the windshield for the wing retainer dowels but do not cement them in until later after fitting the windshield.

Temporarily install the engine mount. Cut the nose side pieces from 3/8" soft balsa and epoxy in place. Use left over epoxy to spread across the underside of the windshield block for reinforcement. When dry, fill in the front and bottom of the engine compartment with 1/2" sheet but do remember to provide some drainage. Sand the nose to a nice streamline shape. Fit the rudder and elevator servos into the hatch at the underside and install small pine blocks at the corners for hatch retaining screws. Make hatches of 1/16" ply. Install gussets as required, making certain that the rear wing retaining dowel is securely reinforced with epoxy. The wing saddle area can best be fitted after the wing has been completed.

WING

The wing is constructed in the classic D-Spar manner. The undercamber does require considerably more care in that the rear spar and front part of the trailing edge must be blocked up to an elevation conforming to the smooth transition of the airfoil outline. This is easily accomplished by the use of scrap wood blocks. The spars are of 1/8" x 1/4" spruce, with balsa webbing between the upper and lower spars. If you can't find spruce, use pine. Planking on the leading edge is of 1/16" balsa on the prototype but subsequent models have 1/8" x 1/4" turbulator strips, two of them spread equidistant between the main spar and leading edge. This offers a noticeably slower glide with but a small loss in penetration. Take your choice. The option is provided for those who despise planking leading edges as I do.

Polyhedral is not necessarily a contributing factor in RC. Turns are much smoother without it and crosswind taxiing proved much easier also. The central dihedral proved adequate for good stability. But, it sure looks beautiful gliding in as it sort of rocks confidently to the tune of the slightest ripple in the air. It just seems to pull at the old heart-strings. Build two wings, one of each configuration as I did. Be certain to use ply dihedral braces.

EMPENNAGE

Construction here is self-explanatory, but make every effort to keep it light. Every ounce here means a counter-balance of a ton at the nose. Use hard balsa at the hinge line but real light stuff for the rest. Free flighters use the right stuff, so why can't we?

The rudder installation is a little bit tricky. The idea is to slice out the hinge locations then temporarily remove the hinges. Cut 3/8" strips of MonoKote, or Solarfilm, and cover the hinged areas before permanently installing the hinges. Then epoxy in all but the rudder half of the hinges. Locate and drill a 1/16" hole in the rudder to receive the wire tiller from the tail wheel. Cover the right side of the rudder and slip it onto the hinges which have already been installed to the fin. At the same time mating the tiller wire. Epoxy the hinges (or pin them) and MonoKote the left side.

BALANCE

No strain here. One third of the way back from the leading edge is perfect. Now we find out about long tail moments, and whether or not we used good judgement in wood selection. I might mention here that my latest Baby was built up of 3/16" square longerons and zig-zag Warren truss diagonals requiring only one ounce of nose ballast. It seems, however, to be standard practice in RC to go the sheet balsa route for strength.

TRIM AND FLYING

The undercambered airfoil will require three washers of down thrust. A .15 engine will haul you straight up at full throttle so full down trim is a prerequisite to take-off. Straight and level flight calls for neutral trim and a throttle setting slightly above idle. If you have a fast idle, then you are not going to land until you are out of fuel.

The plain dihedral wing will fly inverted and snap roll with delight. If you should later advance to yearning for ailerons, you will need only to build another wing with an integral servo and not an entire airplane. But, for learning to fly power or just plain old relaxed Sunday flying, the Baby will take you home in one piece feeling that good kind of tired.

Buddy, you've got an airplane! □

From RCModeler May 1974