MECHANIX ILLUSTRATED

BABY ACE

KING OF THE HOMEBUILTS

BY JACK MATHIESEN

Like many sport modelers who live in less populous areas, I'd always looked forward to the arrival of R/C Modeler Magazine, but it usually takes me 3 or 4 trips to the local Hobby Shop, before they finally received the new issue. It was on one of my daily visits to the newsstand, that I happened to spot the October 1973 issue of Mechanix Illustrated with the Baby Ace on the cover. I immediately became interested, bought the magazine, and went home to study it thoroughly.

The original full size airplane was built 20 years ago by Paul Poberezny, President of the Experimental Aircraft Association, for Mechanix Illustrated, and was published in MI in 1955, as a three-part, build it yourself construction article. The Baby Ace has since been constructed by more than 400 homebuilders. Paul Poberezny modified the design of the Corben Baby Ace which goes back to the 30's. He modified this airplane and redesigned it into an open cockpit, single seater, parasol monoplane capable of good performance with any engine from 40 to 150 hp. Thus, it became the first EAA airplane designed for modern home aircraft builders. Its success, and the popularity of the MI story about it, was an important ingredient in getting EAA off the ground. Like most homebuilt aircraft (and models) if operated and given good maintenance, it provides many hours of pleasure and safety in the air for its owner.

Living in Southern California means almost 365 days of beautiful flying weather, and the day for the test flying of my Baby Ace was no exception. It was a perfect day in mid December, about 75 degrees, and with just a little breeze. From the first moment when the ship tracked straight and true down the field, with only a little right rudder required for a perfect take-off, I could tell I had a real winner on my hands. After a bit of up elevator the Baby Ace was airborne.

This is the moment you have been waiting for - - - to see your own designed model plane flying against the clear blue sky. This is your reward and it makes you feel proud and good all over. After a few circles over the field I set up the landing approach and the Ace came in at about 1/3 throttle and made a smooth landing. After a fast check out (everything looked OK) she was off again. This time a beautiful loop was accomplished and then a roll. The latter was a little slow and she lost some height so put her nose up and she will roll, fly inverted, and a few other things not in the book, but do not forget the Baby Ace is not made for all-out stunt flying!

The construction of the Baby Ace is about as uncomplicated and straight forward as can be had with a scale R/C plane, so let's clear the workbench and get started.

WING

The wing should be constructed in two pieces on a building board. Use hardwood and medium balsa for the spars and leading and trailing edges as per plan, medium balsa for ribs and capping. Make certain the leading and trailing edge are warp-free when positioned over the plans. The ailerons are constructed at the same time the main framework of the wing is on the building board. Be sure to avoid any warping since a warped wing or tail will ruin everything and **it will not fly.** If straight and true, balanced as per plan it will fly and fly well.

The trailing edges are propped up 3/8'' at the tips for washout. Add the balsa covering on the leading edge of the wing and capstrip the top and bottom. Remove the wing from the board and join the wing halves, adding the 1/8'' plywood center rib and dihedral braces. Be sure to use plenty of glue at this point. Bolt the 3/32'' brass tubing on the center rib at the proper angle, it is very important here to measure from the plan for the wing incidence. Then plank the top and bottom center, add the plywood aileron bellcrank and wing strut bases.

EMPENNAGE

The rudder and stabilator are made in the same manner as the wing construction. Once again, be certain to build these on a flat surface and use plenty of cement to insure a torsionally stiff and warp-free flying surface. Add your favorite hinges and horns.

FUSELAGE

The good old fashioned built-up frame with filled in front sides and bottom are used on the Baby Ace. Use hard balsa or hardwood for the corner longerons. Build the two sides over the plan and when dry, pin upright on the top view of the plan and add the firewall with cut-out for the fuel tank and motor mount box. Then add all cross braces, remove from plan and add the bottom 1/4'' balsa sheet and 1/4'' plywood. Install the blind nuts for mounting the landing gear. Now is a good time to plan your throttle linkage.

Originally built in 1955 for Mechanix Illustrated Magazine by Paul Poberezny, President of the EAA, the full-size Baby Ace was a three part construction article the first EAA airplane designed for modern home aircraft builders. The R/C version presented here is an easy-to-build scale model that was the 3rd Place Winner in R/C Modeler Magazine's 1974 Design Contest.


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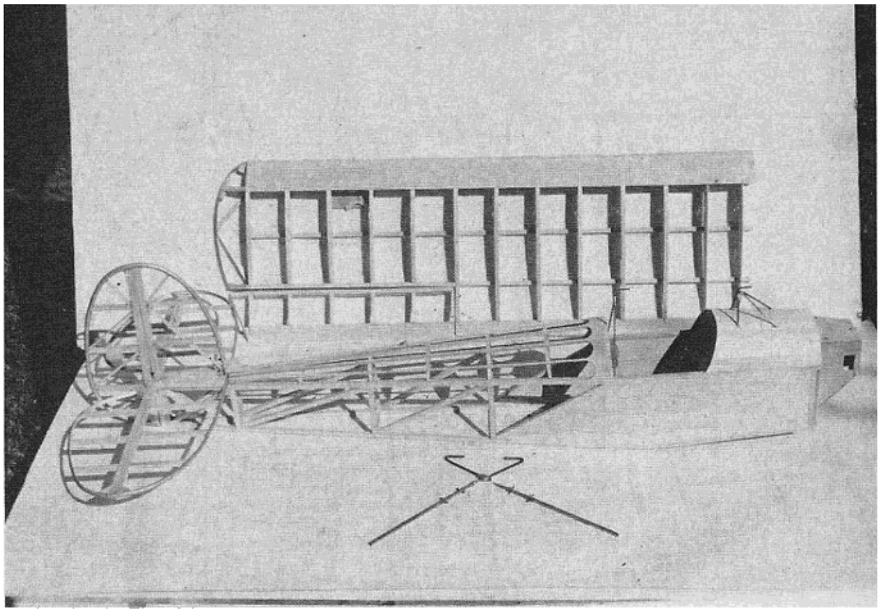
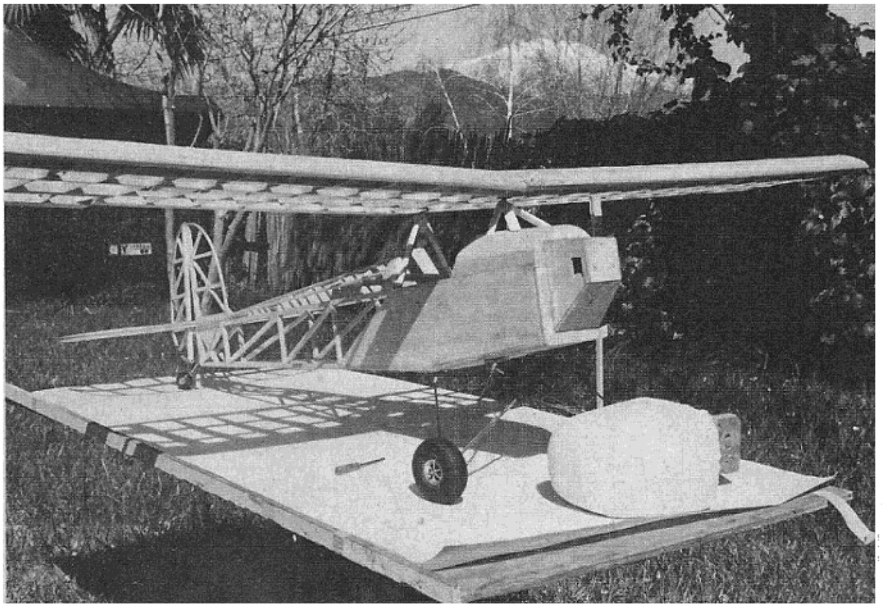
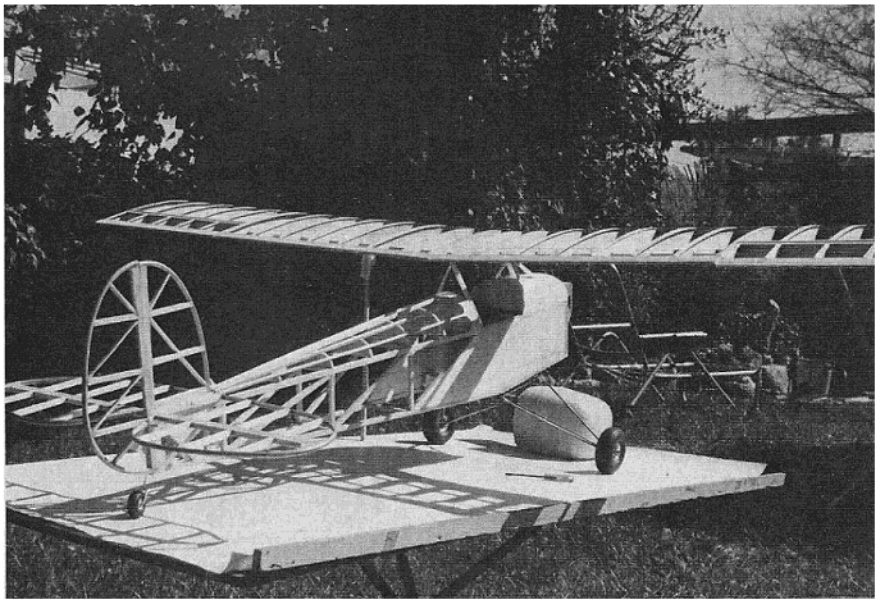






Bend the 3/32" piano wire cabane struts and solder with silver solder, and install in "plywood boxes." Be very careful to get the right angle - - - do a little measuring here and use a square to get it right. Install the instrument panel former and top planking. Add the turtleback former and stringers, fill in between the stringers behind the seat with 1/8" balsa. Now cut out the motor mount box of 1/8" and 1/4" plywood, front plate, and install the blind nuts for the Tatone aluminum motor mount. Before epoxying together, epoxy to the firewall. Drill holes on the side your fuel line comes to the engine and for the fill and overflow lines. Install the steering tail wheel.

BABY ACE
Designed By: Jack Mathiesen

TYPE AIRCRAFT
Sport or Stand-Off Scale
WINGSPAN
64¾ Inches
WING CHORD
10¾ Inches
TOTAL WING AREA
677 Square Inches
WING LOCATION
Parasol Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1¼ Inches
O.A. FUSELAGE LENGTH
43 Inches
RADIO COMPARTMENT AREA
(L) 10" X (W) 4" X (H) 4"
STABILIZER SPAN
20 Inches
STABILIZER CHORD (incl. elev.)
7 Inches (average)
STABILIZER AREA
140 Square Inches
STAB. AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top Of Fuselage
VERTICAL FIN HEIGHT
6¾ Inches
VERTICAL FIN WIDTH (incl. rudder)
7 Inches (average)
REC. ENGINE SIZE
.25 to .40 Cu. In.
FUEL TANK SIZE
6 Ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
4
CONTROL FUNCTIONS
Rudder, Elevator, Throttle, Ailerons
BASIC MATERIALS USED IN CONSTRUCTION:
Fuselage .....Balsa and Ply
Wing .....Balsa, Spruce and Ply
Empennage .....Balsa
Weight, Ready-To-Fly .....75 Oz.
Wing Loading .....16 Oz./Sq. Ft.

MISCELLANEOUS DETAILS

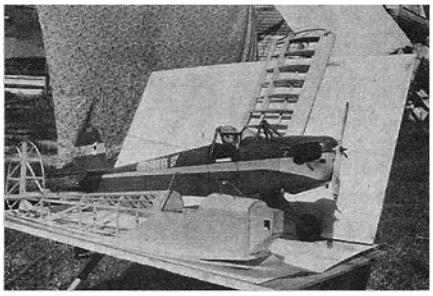
The fiberglass cowl was made by using the Hobbypoxy Easy Does It method or alternately, it can be made with boat resin and glass cloth over a block of wood shaped

to the exact size and shape from plan. The cowl is attached with screws to the outside of the firewall. The engines exhaust goes out through the bottom of the cowl, using a homemade muffler made of a piece of 3/4'' aluminum pipe from an old lawnchair with a bit of 1/4'' aluminum pipe insert, blasting that oily mess out below.

Construction of the landing gear takes a bit of cutting, bending, drilling and soldering, but it is worth it. To see the Baby Ace on take-off and landing, both on runway and on rough ground, is a pleasure as the Ace moves forward without any vertical movement, while the wheels ''dance'' on the ground. The landing gear is shock absorbing like on the old Piper Cub, utilizing telescoping tubing with rubber bands as sponge cord. The center part is silver soldered on to metal straps which, at the ends, acts as a pivot for each side to the wheel. The wing struts are fastened to the wing by small S-bends and at the fuselage end by hooks for rubber bands through the fuselage aluminum tubing. Remember to toe-in your wheels, it is very important on a taildragger or you will have an airplane groundlooping all over the field.

Use hardwood and hard balsa for the wing struts. Cut them to the proper length and sand to a streamlined section. Make S-shaped hooks for the top and U-hooks at the bottom part of the struts, then bind and glue. The jury struts are made of wire in this order: Slip two pieces of brass tubes, 1/4'' long, over the wire, and start bending to shape and cut to length. When done, solder two pieces of metal strips 1/2'' wide, around the main struts at the jury strut location, then solder the brass tubes on the jury struts to the two metal strips on the main struts in the proper location. Now attach a little eye to each inside of the main struts for cross wires.

A piece of 1/8'' balsa was used for the cabin floor screwed to rails so it is removable. This is also a good location for the power switch and, of course, the pilot. Install an instrument panel with gauges.



COVERING AND FINISHING

The Baby Ace was entirely covered with Solarfilm in the original color - - - bright red, with yellow trim and black numbers and white lettering cut out and put on with Solarfilm solvent. The MI letters can be made by tracing from a cover of MI, or just tape the letters over the white sheet and cut right thru both layers. Do not leave out these details, since it makes the airplane complete and really looks sharp as you can see from the photos. Be sure to obtain a copy of the October 1973 Mechanix Illustrated for good pictures of the full size aircraft and close-up views of scale details. □

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