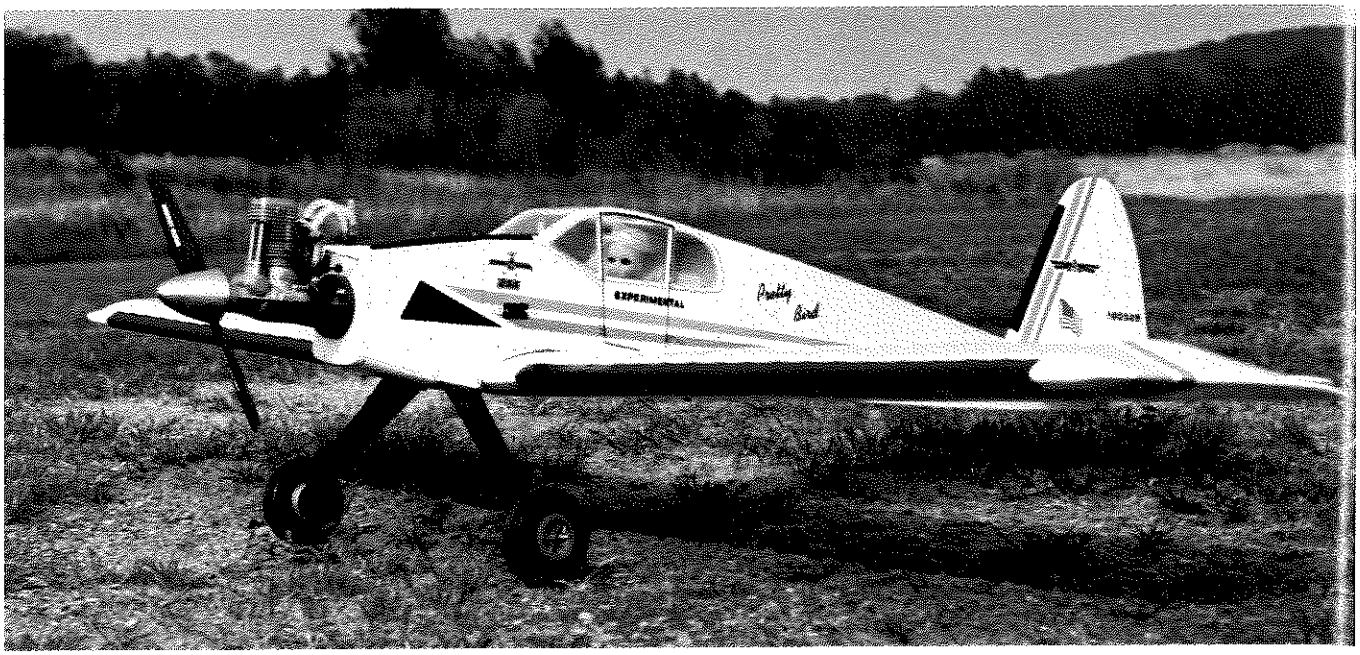


"Pretty Bird"

By ALEX McLEOD. . . A slow, aerobatic model for .40 to .48 size four-cycle engines. Lightweight structure is its main feature. Full-size plans are available through Model Builder Plan Service.

• Beauty is only skin deep, but "ugly" goes right to the bone. The Pretty Bird is based to some degree on a .20-powered design from *Model Aviation* magazine. It is not a beautiful aircraft but a "Plain Jane Plane" that has been to the beauty parlor. A paint scheme that makes it look somewhat like a homebuilt helps to disguise the squarish lines, but, indeed, it looks a little like a Davis homebuilt.

Pretty Bird is a functional airplane, built very light to be aerobatic, yet fly slowly with low, quiet power, and be very forgiving. It makes the novice pilot look good.

There are two schools of thought regarding aircraft weight. The first one says, build them strong regardless of weight so that they won't break when they hit. The second school says, build them light enough and they won't break even if they seem flimsy. With most of us, common sense dictates a compromise between these extremes. Unfortunately, the heavy radio gear, landing gear, and motors will help to break light structures, if not in flying, then in handling around the workshop or transporting in a car; therefore, you need a light but strong structure, and the Pretty Bird has it.

Those who want a fast-built, heavier airplane can use 1/8 sheet balsa sides, top and bottom on the fuselage right to the tail, along with 1/4-inch sheet balsa tail surfaces, but if you want an agile performer that won't break like an egg, and don't mind a little more work, then the structure shown on the plans is for you.

We have all heard of planes that flew right off the drawing board, but this one actually did fly without trim changes. Because of its light weight, it still flies well at reduced power, but much slower. I've even tried thermaling with it. Several low-time pilots in our club who flew it wouldn't give back the transmitter, simply because it was the first low-wing aileron plane they were comfortable with. You can fly anything if you have enough power, but this low-powered airplane gives you all kinds of time to think and even change your mind.

Uncowled engine keeps things simple. Model is shown here with the original fiberglass landing gear, which was a bit too flimsy and was later replaced by the wire gear shown on the plan.

CONSTRUCTION

The plans should be clear enough if you have built a few models already. This is certainly not a first-time model, but if you have flown a glider or a high-wing trainer, then this will be an excellent transition ship to a low-wing, aerobatic plane. If you're trying to perfect maneuvers in sport pattern models, it will allow you to do them more slowly, step by step, over the field without flying into the next county and without rekitting your hot model. Remember, in aerobatics it's accuracy first, then speed.

As was mentioned earlier, if you want a knockabout sport model that flies well, you can substitute 1/8 sheet balsa for the spruce framework of the fuselage with 1/8 square balsa where the spruce framework is shown and 1/8 sheet on top and bottom. The tail surfaces can also be cut from 1/4-inch medium sheet. Remember, this version will be heavier and needs more power to fly; therefore, it will be faster. This heavier version has been built and flies well, but it defeats the whole object of a slow aerobatic model.

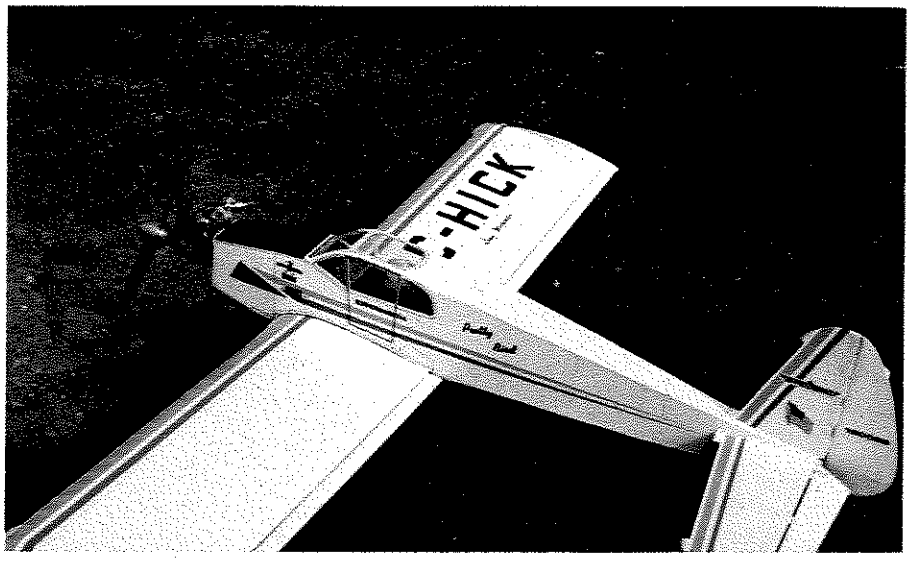
For those of you who do not have an aversion to built-up stick construction, keep in mind that to ensure a strong, light model you must use gussets at every right angle

joint of the spruce or balsa structure. They are almost as strong as diagonal braces. The gussets should be cut from square stock balsa at 45 degrees so that the grain of the wood runs parallel to the longest side (see the sketch on the plans). This wood should be as thick or thicker than the structural members so that it can be sanded down flush and help support the covering. When completed, a small cylindrical Dremel tool is used to cut away most of the wood, leaving a transition curve so stresses will not break the glue joints. It is more work, but well worth it. First count the number of corners, then cut the gussets using a fine-toothed saw blade. I used over 100 in the original model.

FUSELAGE

The fuselage is built by constructing the right and left sides, with doublers on the inside. The forward part is made from sheet and the back from spruce longerons and balsa uprights. The structure on the plan shows 1/8 sheet and 3/16 square strips with 1/32 birch ply doublers. I went ultra-light and used 5/32 square spruce and balsa, which I cut on my Dremel table saw. It's plenty strong enough if you take care, but you must cut your own strips.

Cut out formers #3 and #4 from 1/8 lite-ply. Make cutouts to suit your battery and tank arrangement. These then are glued perpendicular to one side as shown on the plan (use a square to check). The other side is then glued in place, ensuring that the tail post lines up properly. The plywood firewall, former #1, is added to the very front of the sides after the blind nuts are epoxied in place for the motor mount. Hardwood triangular stock is used in the corners between former #1 and the fuselage sides for strength. Add the other formers, cross pieces, tank and cockpit floor sheets. Now drill holes in formers #1, 2, and 3 for the throttle cable tube and epoxy it in place. The plywood landing gear sheet and side blocks are epoxied in place, then 1/4-inch sheet balsa is glued cross-grained on the bottom from there forward, to the point shown. Balsa sheet wing saddle triplers and cockpit interior outlines are now glued in place. Add crossgrain sheeting on top where shown. Be sure to allow for a tank access hatch on top, if you wish one; if not, install the tank and vent tubes where suitable for your engine.



Pretty Bird's squarish lines show up well in this photo. A very functional airplane. Note how the top of the cabin is covered with clear plastic to simulate a "greenhouse" type of canopy.

I like to build a hard point in the fuselage for rear strut attachments for floats. If you want to do likewise, insert a piece of 1/8 birch plywood 1-1/2 inches wide behind former #4 on the bottom of the fuselage (right behind the wing) between the longerons. Balsa sheet inserts on the fuselage sides near the tail are needed for the control rod exits. Also, a plywood base on the bottom at the tail is needed for mounting the nylon tail wheel bracket.

LANDING GEAR

The landing gear is bent to shape from 5/32 wire. The original model had wood fairings held on with epoxy and were covered with heat-shrink tubing of the type used on helicopter blades. Earlier I tried a gear made from glass cloth and Hobby Poxy #2 glue. It worked well for a while but I didn't make it thick enough and it began to deform after a few weeks. Certainly it was much lighter and worth a try. Perhaps 20 layers of medium cloth would do it, with a layer of carbon fiber on top and bottom.

WINGS

The wings are built in two separate panels, joined by two 3/16 music wire rods 9 inches long. This makes it easier to travel with them in a small car. If you don't want to do this, just build them in the usual way with the 1/8 ply dihedral brace shown.

Cut 24 ribs and 18 sub-ribs from medium hard balsa. The six center ribs are undercut to accept the 1/16 balsa covering on the center. Assemble the panels over the plan, pinning down the trailing edge sheet, then the square balsa trailing edge itself and finally the spruce lower main spar. The ribs are glued in place with cyano, the hard balsa leading edge next, then the sub-ribs, and finally the two top spars. The upper trailing edge sheet is glued in place after

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Fun-fly time! Author flies the Pretty Bird under the limbo ribbon at a recent meet held in Canada. Model is ideally suited to this kind of flying.

Use standard adjusting techniques for flight but make sure the model balances on the center spar. Adjust gliding flight with tail setting and powered flight pattern with thrust line changes. •

Pretty Bird. . . . *Continued from page 15*

bevelling the trailing edge to conform to the ribs. When lifted from the plan, add the leading edge spar on the bottom. Vertical grain webbing between ribs is glued to the rear of the main spar. Add the tips next; these can be made from four laminations of 1/16 x 1/4 balsa strips or 1/4-inch sheet balsa, or, as I did, you can use hard 1/8-inch aluminum welding rod to make the bow with hard balsa supporting triangles. This same method was used for the tail outlines for extra strength and light weight. Your local welding supply shop should be able to sell you a few three-foot lengths.

Decide whether you want a one- or two-piece wing and epoxy in either the 3/16 I.D. brass tubing with supports or the 1/8 ply dihedral brace, and angle the center ribs accordingly. Four balsa blocks are glued into the center section to receive the 1/4-20 nylon wing bolts that fit through the blocks into tapped 1/4-inch plywood nut-plates in the fuselage. Sheet the wing center section with 1/16 balsa sheet.

TAIL ASSEMBLY

Using stringy, fairly hard balsa for the tail members, the outlines can be laminated from 1/4 x 1/16 balsa strips or bent from hard 1/8-inch aluminum welding rod or, if you don't care about weight, cut the whole thing from medium C-grain 1/4-inch balsa sheet. If you wish to be able to disassemble the model for travel, epoxy into the stab two 1/4-inch plywood pads, drilled and tapped as necessary. The built-up tailplane should also have corner gussets as in the fuselage.

FINISHING

The choice of covering is up to you. A good quality of heat-shrink film would certainly be the lightest way to go, and if you are skilled with it, use it. I used Sig Koverall and Supercoat butyrate dope. I felt that such a light structure needed a lot of skin strength that wouldn't peel with wear. This may weigh a few ounces more than heat-shrink plastic, but it is more permanent, and it's waterproof if you like float flying.

FLYING

After installing the radio and checking it thoroughly, be sure the balance point is where it is marked on the plan or even a little ahead. Shift the radio as necessary to achieve this balance. I have to admit to making the first flight of this model at a club fun-fly, and 10 seconds after takeoff greasing it under a limbo three feet high. However, I don't advise anyone to test any model at a crowded flying site.

Many people don't like taildraggers because they tend to nose over and generally have poor ground handling. The Pretty Bird doesn't like to nose over and can handle direction changes up to 40 degrees on takeoff or landing. All I can say about flying is that it will do anything the power you provide permits, *but slowly*. Inverted flight is fun because it flies so slowly everyone thinks it will stall, yet snap rolls and spins are violent but stop immediately when controls are neutralized. Landings are a joy since it will come in nose high, without dropping either wing. Try it, you'll like it. If you have any questions or suggestions, contact me at 352 Park St. N., Peterborough, Ontario, Canada K9H 4P5. Happy flying! •

Ramblin. . . . . *Continued from page 41*

Australia is the marketing test ground for made-in-the-Orient model products. The Model Engines' huge warehouse was chock-a-block full of engines and kits and accessories I'd never seen before! I suspect the items that sell the very best in OZ are the ones we finally get to buy here in the USA.

The Lloyds arranged an overnight visit with Paul Straney who is their country's model aviation historian, owns a significant model engine collection, and is an avid model builder. It was one of those super evenings most modelers just dream of having. USA's Bill Brown built his first model engine in 1931, but Paul showed me a piece of true Australian model history; he owns a made-in-1929 Astral Tornado made down under by H. Allenby. The engine is a world treasure. Paul is a retired flight engineer from Ansett Airlines and continues his aviation love affair through drawing and building his own free flights and R/C models. Paul had scaled and built a Taibi Power-