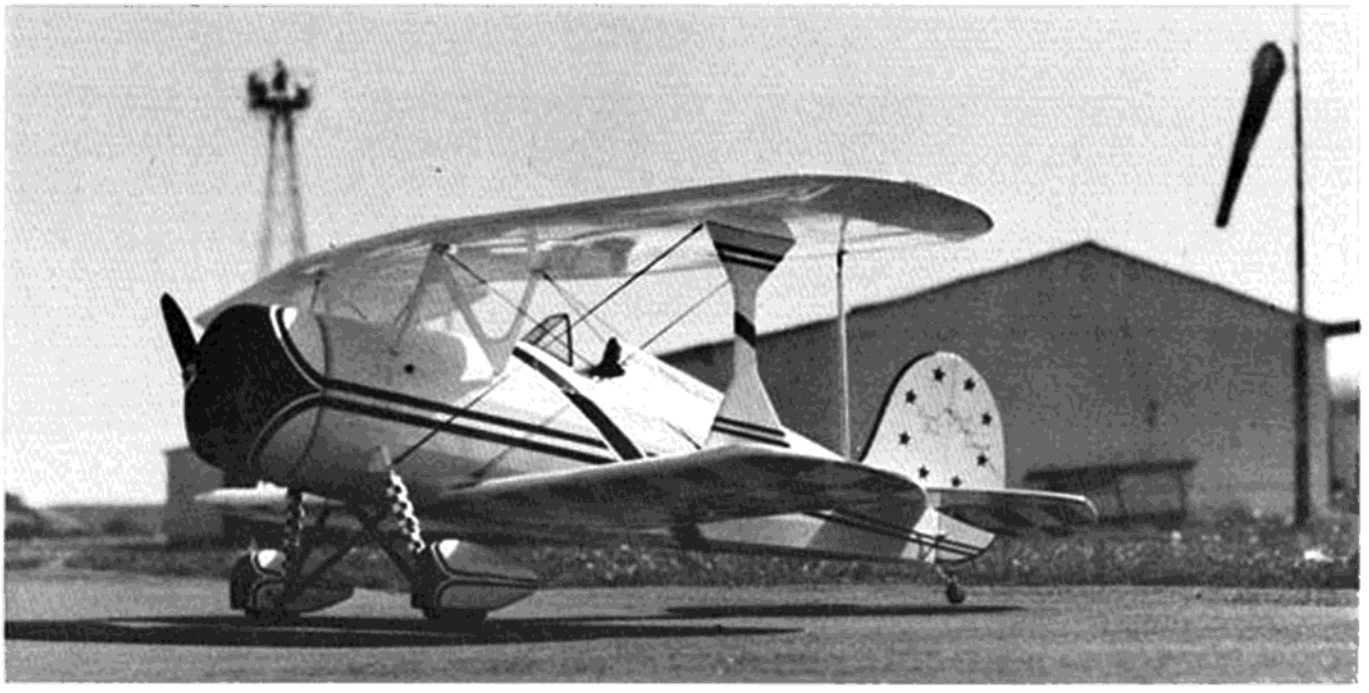


Krier GREAT LAKES Special

By LARRY SCOTT . . . Designer of last November's three-inch scale Waco Taperwing comes through with another classic aircraft in the same scale . . and a biplane, of course. Not only that, it's *sensible* Giant Scale, with an overall weight of eighteen pounds. Cowl and wheelpants in 'glass available from Larry.

• If I was asked to pick my favorite airplane, I doubt if I could do it. One thing I am sure of, however, is that it would have two wings and a round engine. I also prefer a model with a lot of aerobatic potential, as this is the type of flying I like to do the best. After I read an article on Harold Krier's Great Lakes Special, I really got the urge to build a model of it. When I saw the three-views listed in Bob Holman's catalog, I ordered them immediately. I drew up some plans and built a quarter-scale model with a wing span of 80 inches and a total weight of sixteen pounds. I used a Webra .91 for power. It flew very well at this weight, and I won Giant Scale at the Sig contest (IMAC) at Montezuma, Iowa. (I believe it was in 1978.) I have since built two more models with some slight change in the plans to make them more scale. Both of these models flew very well, the first on a Suevia (1.5 cubic inch) engine and the second with a Quadra engine for power, at eighteen pounds. The model is very easy to fly and also pretty simple to build, so I won't go into too much detail on the construction of the plane.

FUSELAGE CONSTRUCTION

If you have built a Sig Kadet or any similar type trainer, you can build this fuselage, as it is of a very simple box-type construction. The first thing to do is cut out the sides from lite-ply, and the formers and firewall from plywood and lite-ply. Lay both sides flat over side view of plan and mark position of formers on fuse sides. Now you are ready to glue on F1 (firewall), F3, and F4. Use a small

Not, it's not Grizzly Adams, it's Larry Scott at Sig's 1980 IMAC contest, with his second GLT, Suevia powered. AMA's John Worth in background. Quadra and 18 lbs. total weight is just right.

square or triangle to be sure these are vertical to the first fuse side. The next step is to lay the other side on top of the formers and glue it on. Square the formers to this side too, just to be sure everything comes out right.

Now pull the fuse sides together at the tail and epoxy together, being sure the tail end of the fuse is vertical with the fuse laying on the top side flat on the table. Cut out a sheet of lite-ply to fit top of fuse. This should reach from front of fuse to front of F4. Glue on with epoxy.

The next step is to make your landing gear and cabane struts from piano wire. You will need a vise, two pair of vise-grips, and lots of muscle, to bend the landing gear, as the 1/4-inch music wire is very hard to bend (it can be made from 7/32 wire, if a smaller, lighter engine than a Quadra is used). The cabane struts must both be exactly the same height, as this sets the wing incidence. Glue the cabane struts on with 3/4-inch x 1/2-inch pine blocks across the top of the fuse. These should be grooved with a Dremel router or a table saw. Fit the landing gear in the pine blocks on the bottom of fuse and solder back gear ends onto bottom of front gear, then glue and clamp it into pine blocks with small straps of brass and metal screws.

The basic structure is now complete. All that is left is to add the outer formers, sheeting, and stringers. Sand the stringers down and taper them to about 1/8 inch thick at the tail.

The tail surfaces are all built from 1/8-inch balsa with half-ribs on top and bottom sides of 1/8-inch square balsa, leading edge of 1/8 inch balsa sheet, and spars on top and bottom of 1/8 inch x 1/2 inch spruce. The elevators on both sides, and rudder, have a leading edge spar of 1/8-inch x 1/2 inch balsa. I used Jet glue to glue all of this together, it's fast, light, and very strong.

Before building the wings, I would suggest cutting out all the ribs and other parts, then once you start building things will seem to go a lot faster. Two wings aren't really that much extra work (or are they?). It's worth it though (isn't it?). All the ribs in both wings are the same (WR3) except three (WRT1) in the top center section. Make two of the WR3 ribs from 1/8 inch plywood and the rest of the ribs from 1/8 inch balsa. The tip blocks are made from 1/4-inch sheet balsa in three sections and glued together when fitted to wing tip.

WINGS

The bottom wing is built in two halves over the plan, pretty much the way most trainer wings are built. Pin the front and rear spars down over the plan, blocking the rear spar up off plan with scrap 1/4-inch balsa at least six places. Next, glue all ribs onto spars, then add the leading edge of 3/8-inch square balsa and the trailing edge bottom sheet. Sand top of leading edge to contour of ribs and glue top leading edge sheeting on. Sand top edge of trailing edge sheet to slight bevel behind tips of ribs and glue top trailing edge sheet on with Jet glue. The top blocks W1, W2, and W3 should be fitted and glued on at this time, after which, you may bend the spars down on top and up from the bottom (notch them into the 1/4-inch balsa top blocks slightly and epoxy). The spars may have to be sawed part way through several places to get them to bend smoothly and then glued and filled with Jet glue and balsa sawdust. Glue short pieces of sheeting on top from tip of the rib out to tip of wing. Make the tip ribs for the ailerons and use these to mark the other ribs in the ailerons so they may later be cut off at the same angle as the tip ribs. Cut the three ribs off in each aileron at back edge of rear spar and cut ribs off at front of aileron where they were previously marked. Add tip ribs and leading edge of 1/4-inch balsa sheet. Glue in 1/4-inch sheet balsa trailing edge section of wing ahead of ailerons. Add the rest of the wing sheeting top and bottom of wing and you are ready to build the other half of the wing.

Glue the two halves together with one inch of dihedral under each tip and reinforce the center section with six-ounce fiberglass cloth and K&B polyester resin.

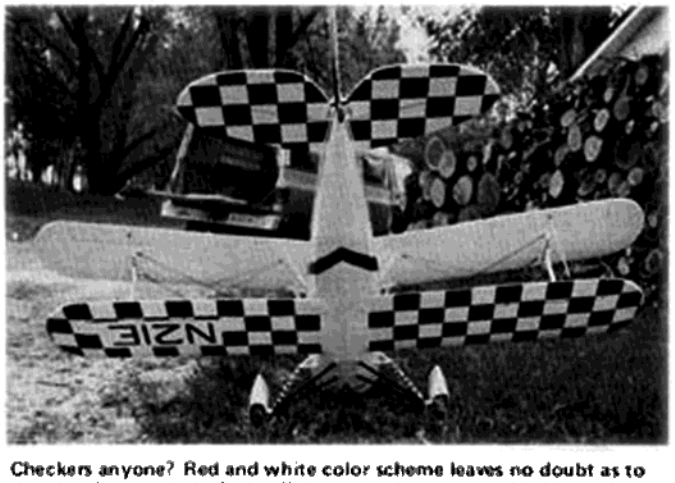
The top wing is built in one piece over the plan. There is no rear spar, so I block up the trailing edge of the ribs with a piece of 1/4 inch balsa from the top to the center section even with the front of the aileron and across center section under the back wing mount blocks.

The top wing is built about like the bottom. First, pin down the main spars, glue the ribs on, then the bottom trailing edge sheet and leading edge. Sand leading edge on top and trailing edge sheet on top behind rib tips. Glue the top sheet on the trailing edge, then the leading edge. Remove from board and add 1/8-inch x 1-inch ply strips and wing mount blocks in center section. Add 1/4-inch balsa sheet on trailing edge of center section and balsa blocks in center section. Put the wing tips on and finish sheeting the wing. Mark where the wing mount blocks are located and drill them later when mounting wing on cabane struts. Glue in the I-strut mounts on the inside of the third rib from tip on the top wing and on the outside of the second rib from the tip on the bottom wing.

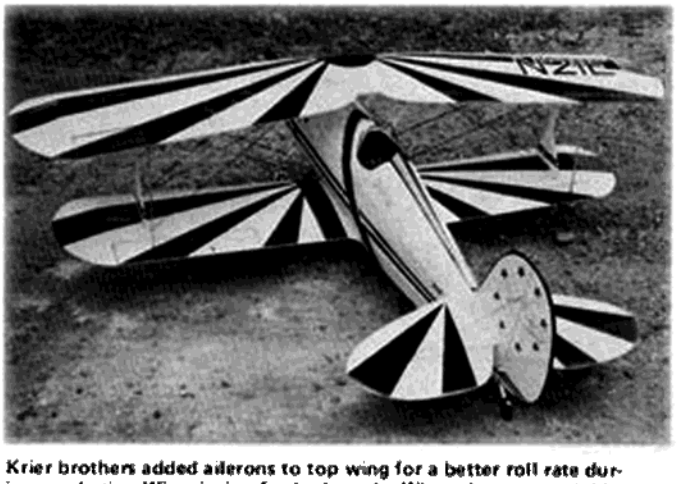
COVERING

I covered all three of my Great Lakes models with Super Coverite and finished with K&B Super Poxy paint. I would not recommend using any of the mylar covering materials on this model, as it needs the extra skin strength. However, if mylar covering is used, possibly the wings could be strengthened enough by adding 1/64-inch ply shear webbing on the front and back sides of the spars. Another alternative would be to add functional wing brace wires, but this makes the model very unhandy to take apart for transporting to the flying field.

All of my models have been flown through every type of maneuver I could think of, with no structural failures in any of them when powered with engines up to and including Quadras. I sold the last one I built to a fellow modeler in Kansas City. He installed a World Engines' Twin Tartan engine (2.68 cubic inch glow). It reportedly would do any maneuver in any direction until the stabilizer broke. The model wasn't designed with this much power intended, but might be able to stand it if brace wires were added to the tail.



Checkers anyone? Red and white color scheme leaves no doubt as to the plane's attitude in flight. Tail brace is important with big engine.



Krier brothers added ailerons to top wing for a better roll rate during aerobatics. Wire rigging for looks only. Wings demount quickly.

I have molds of the cowl and wheel pants, and will sell them for $22.95 for the cowl, and $16.95 for the wheel pants, plus $2.50 to cover UPS. I also have about two rolls of 35mm film of the original Kreir Great Lakes, taken in a small museum in Kansas, where the plane is on display. I will sell prints of these for $1.00 per print. Please specify how many and what type pictures you would like. I have the usual front, sides, and rear shots, plus all details including cockpit and front of engine in closeup shots. I hope you have as good luck and as much fun flying your Great Lakes as I have had with mine.

My address: Larry Scott, R.R. #1 Box 86, Kirkman, IA 51447, phone: (712) 766-3367. •

Model Builder
Oct. 1982
By H.E