

der JAGER



BY BRUCE R. LUND



Finding a subject suitable for scale modeling is about as difficult as building the model. I know that all of you have some particular model you would like to build but will it make a good flying aircraft? Most of my favorites were either too complex to build, contained too much delicate detail, impossible to authenticate, or just not airworthy. After examining my favorites I decided to be analytical in my choice of a model. For the coming National Scale competition, I would set my requirements down on paper and then build the plane that fit them the closest - - - even if it wasn't one of my favorites. The requirements went something like this.

1. A plane that hadn't been recently modeled.
2. Single engine.
3. Colorful paint job for eye appeal.
4. Long enough nose moment for easy balancing.
5. Simple construction.
6. Very little detail with no flying wires.
7. Plans and photos readily available for authentication.
8. Sensible wing loading.
9. Large tail area.
10. Cowed engine but with adequate cooling.

Finding a plane that met these requirements seemed almost impossible. After searching through my magazine library, I had just about given up when the mailman delivered the March, 1970 copy of Sport Flying Magazine. On the cover was der Jager, a new homebuilt. It looked more like a model airplane than a real one. The color photographs inside whet my appetite even further.

Here was a colorful biplane with no wing wires, a long nose moment and, above all, a large tail. Detailed plans were also available from the designer, Marshall White. I looked through many more magazines but kept coming back to der Jager. Finally, I couldn't stand it any longer and ordered a set of plans for the full sized airplane. Once they arrived I hibernated into my shop with them and, about a week later, came up for air. I now had a set of plans for my National entry. It was large, but not too large. I had decided on a scale of 3" to the foot. My reasoning was that it would be easier to build 1/4 size and allow plenty of room for the engine, and radio gear as well as making detailing easier. The wing worked out to a span of only 60", 990 square inches in area. Not bad if I could keep the total

weight down.

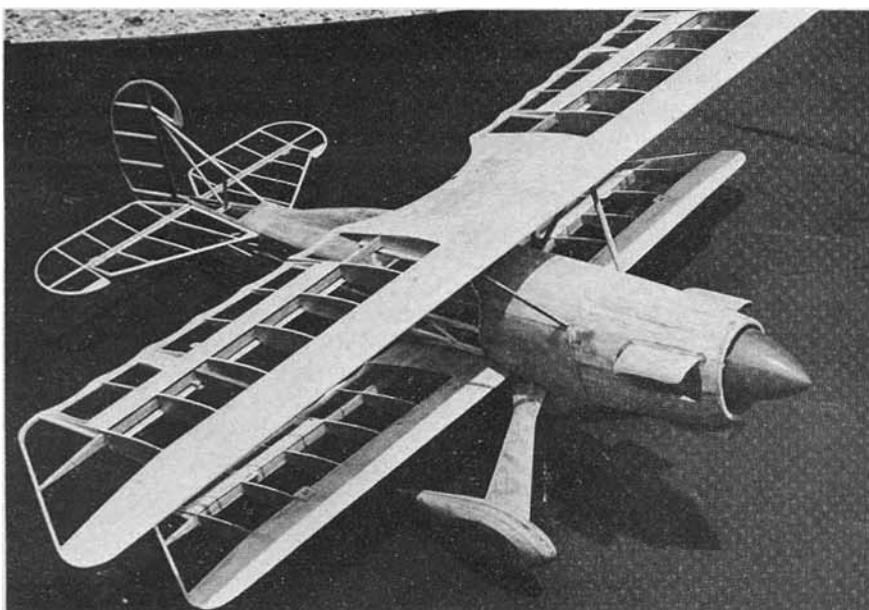
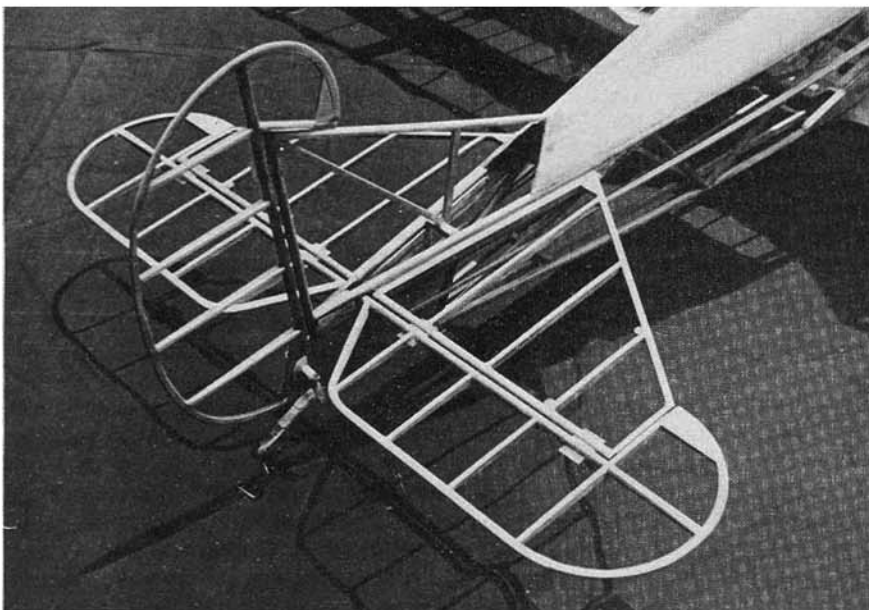
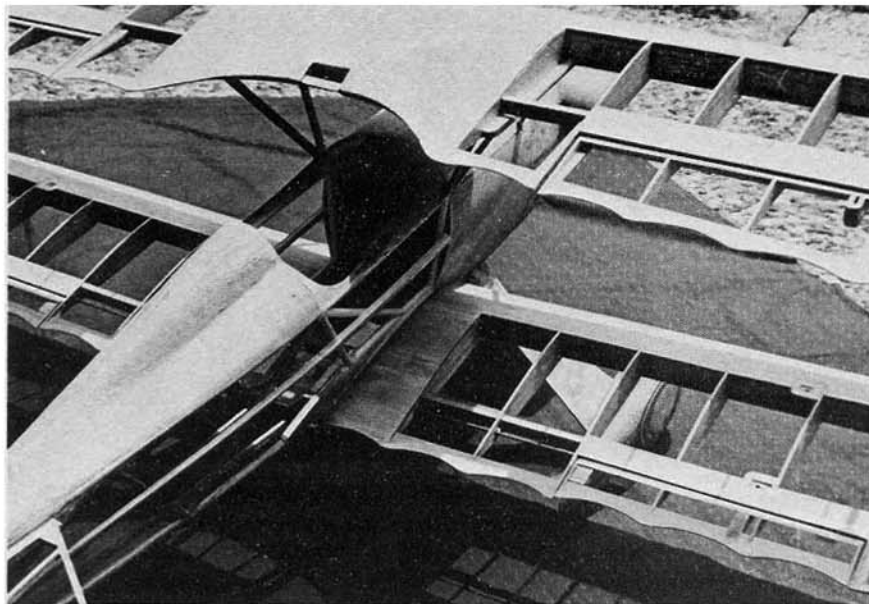
The real plane is constructed very much like a model, and why not, since Marshall White has built and flown many models. He even competed in the 1938 through 1940 Nationals. This plane was constructed so much like a model that I succumbed to the urge to duplicate the structure rather than follow normal modeling techniques. The steel fuselage longerons could be made of dowels and even the scalloped trailing edge of the wing could be easily duplicated. This construction should be good for extra points, particularly in the cockpit.

When you look into my cockpit you see it just like the real one. Tubular stringers, fabric sides, and a 1/4 size instrument panel. The wings and tail were more or less conventional but the fuselage was going to take considerable thought. I was afraid that the tubular framework of the fuselage might be too flimsy. Just to see if it was feasible I started building the framework. By the time I glued the two sides to the firewall I knew I had it made since it was much stronger than conventional sheet balsa sides. Now the sawdust really began to fly.

Many hours or, should I say, months later, it was almost finished. The paint job was completed two weeks before the Nationals. I planned to give it a test hop the week before leaving for Chicago. Just my luck it rained and rained and rained. Finally, late Friday afternoon, the weather broke just before sundown. der Jager lifted off the runway. The lift-off was beautiful, altitude was obtained, and the first turn was entered. Then it happened; the prop and spinner came off and the engine went wild. I cut the throttle and tried to turn back to the runway without getting down wind. Stretching the glide resulted in lost flying speed; it didn't stall but the sink rate was about to get out of hand. The runway was out of reach now so I tried to stall it into the tall grass along side.

When the grass quit swaying der Jager was lying on its back. There was no structural damage done and, in fact, the bomb was the only victim. I knew that the plane would fly so Chicago was still in sight. The bomb was repaired in Cairo, Illinois, the next evening and painted in the Chicago motel room the evening before der Jager was turned in for scale judging.

My first official flight was almost a repeat of the test hop, only this time it was an over-lean engine that began to



be functional and not just for looks. The spar at the hinge line is $\frac{1}{4}$ " birch dowel. The ribs are $\frac{1}{8}$ " x $\frac{1}{4}$ " spruce with each end cut to fit the dowel. The $\frac{1}{16}$ " music wire at the tip of the stabilizer is most important since, without it, the fabric tension will pull the stabilizer ends out of shape. The rudder and fin are made in a similar manner. As soon as the fin is completed it should be added to the fuselage.

LANDING GEAR CONSTRUCTION

Bend $\frac{3}{16}$ " music wire to shape. The "L" shaped piece shown on the plans was not included in the original model. I think it is necessary, though, and I am modifying my plane to include it. The gear is just too long for one piece of wire to be stiff enough. Cut the $\frac{1}{16}$ " plywood center core and balsa pieces. Epoxy them together and sand to shape. The wheel pants are epoxied to the strut fairings. This seems to work well enough. $\frac{3}{2}$ " wheels are installed with the pants as there is no way to add them later. Cover them with masking tape.

The tail wheel spring is made from leaf rake tangs. This is usually a good grade of spring steel. The pivot is a piece of $\frac{3}{32}$ " brass tubing with plastic steel around it. The tailwheel is a 2" wheel cut down to $\frac{1}{2}$ ". This gives it a square cross section more like real planes use. The steering springs are obtainable from most auto parts stores. This system really works. No wonder full size planes use them.

WING CONSTRUCTION

Nothing new here. Construction is tried and true, very similar to Sterling's Stearman. $\frac{1}{4}$ " x $\frac{3}{4}$ " and $\frac{1}{4}$ " x $\frac{1}{2}$ " main spars, $\frac{3}{32}$ " balsa ribs, $\frac{1}{16}$ " sheet balsa leading edge sheeting and a $\frac{1}{8}$ " x $\frac{3}{4}$ " trailing edge. Slip the ribs on the spars. Block the spars up $\frac{1}{2}$ " and glue the ribs in place. Add the trailing edge and leading edge. The tips can also be installed at this point. Now mark and cut the ribs for the $\frac{1}{4}$ " balsa aileron spars. Glue the spars in place and, when dry, remove the wing from your table. Sand the leading edge and sheet the top and bottom as required. Cut the trailing edge and remove the ailerons. Install the necessary blocking for the "N" strut connections. Bellcranks for the aileron controls can be installed in the lower wing. (The original model used torque rods. This proved to be unacceptable and bellcranks are going to be added.) The scallops in the trailing edge can now be cut and sanded.

One place that deserves mention is

the strut attachment points. I have made it as close to scale as possible. Secure a scrap of 1/8" plywood just under the 1/16" sheeting at each attachment point with a blind 4-40 nut. Cut a hole through the sheeting which will expose the plywood. After the wings have been covered and clear doped cut the covering away to expose the plywood again. Install the aluminum strut attachment pieces. Hold them in place with a flathead screw and epoxy glue. Add a little sealer over the screw head and you have it. Be sure to secure the plywood well as the N-strut will actually be load carrying members and not just for appearance.

The "N" struts are cut from 3/16" plywood. 1/8" brass tubing is glued to each end with some brass shim stock wrapped over it. The lower rear strut is made from heavy electrical wire bent around the brass tubing. The cabin struts are laminated with a 1/8" balsa core front and back of the 1/8" wire. 1/32" plywood sides are added and then sanded to a streamlined shape.

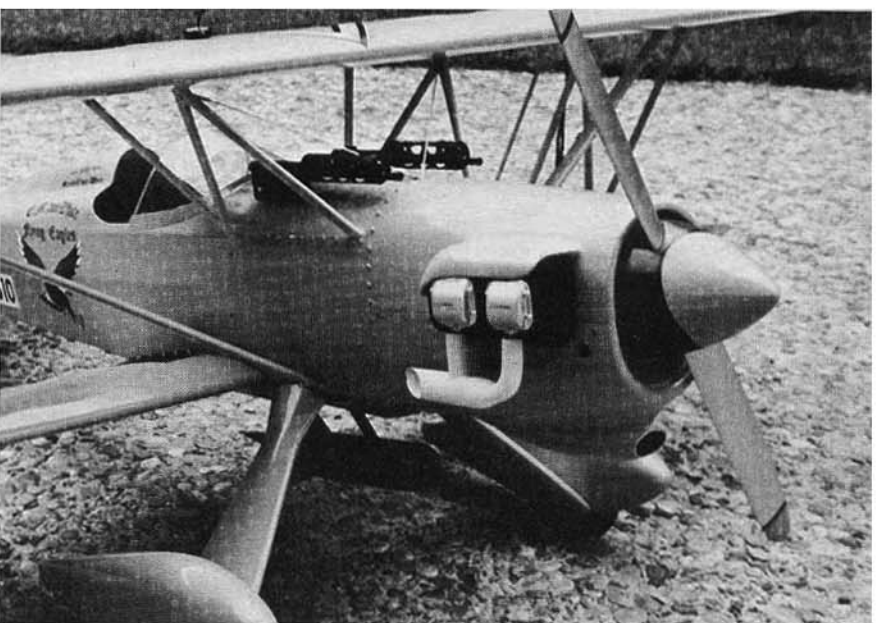
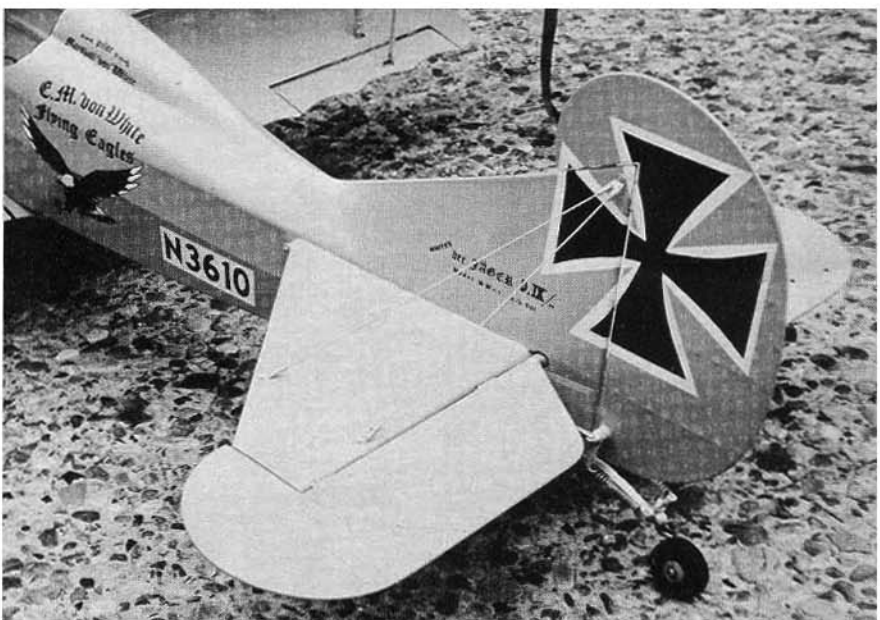
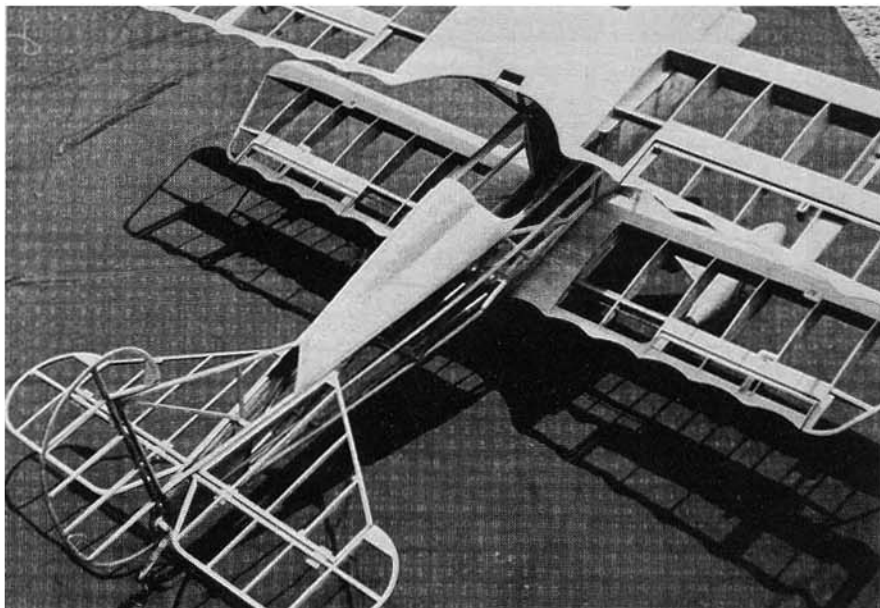
FINISH AND DETAILS

The model is covered with S.P.L. "Shrinktite." This is a heat shrink dacron just like the real der Jager used. It is painted with butyrate dope and has a high gloss finish. The overall color, goldenrod yellow, can best be described as a school bus yellow. The maltese crosses are black on white except for those on the bottom wing which are red on white.

Lettering on the fuselage side is deca-dry old english #2848-L, 2848-C and 2824-CL.

I have been asked many times about the rib stitching; no secret, just use a long needle and thread. I do this after applying the first two coats of clear dope. After stitching, I dope a 3/8" wide piece of covering material over the stitches. This will represent pinking tape as used on full size aircraft. It should have zig-zag edges but this is very difficult to accomplish with any degree of success. After the 3/8" strips are doped in place, proceed with your normal finishing techniques. Just be very careful when sanding the stitches.

The Lycoming engine is made from .060 aluminum discs glued to a 3/4" wood dowel. The dowel is supported from F-5. Valve covers are 1/16" plywood and balsa. The exhaust manifolds are laminated plywood carved to shape. Machine guns are made from balsa and steel beer cans. Flying wires





are made from 3/64" music wire with 1/8" brass tubing for clevises.

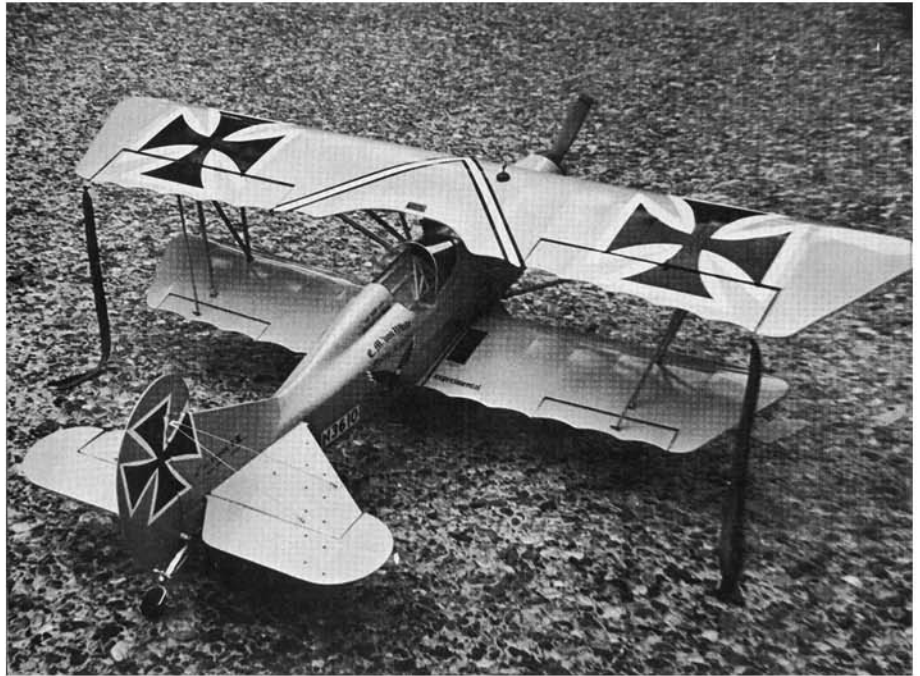
The finished plane met or exceeded my highest hopes. Balance was a bit of a problem since it was nose heavy. Absurd as this sounds, it was true, even with the battery pack located behind the seat back. It was finally resolved by adding 4 oz. of lead to the tail. The final weight was 10¾ pounds. This made my wing loading 25 oz./sq. ft. Better than a lot of pattern ships I know of.

CONCLUSIONS

I feel like I have built a real homebuilt. After all, the model has just about the same number of pieces --- they are just smaller. As I said before, this model is not for the beginner. I build fast and can normally complete a pattern ship in two to three weeks. I estimated that der Jager would take about two months. Boy, was I wrong, it took thirteen months. This was the first full scale ship I have built and I forgot to take into account the times it was set aside due to discouragement, other projects, and just plain being tired of working on the same plane. It is very hard to keep your interest week after week and month after month. Now that it is flying I can look back and say that it was worth it, but it will be some time before I start another project like this.

For those of you who are interested in the full size aircraft, why not drop a line to Marshall White and ask him for the information packet on der Jager. (1863 West Street, Anaheim, California 92802.) He has several other planes in the works and they, too, will probably make good scale models. If I can be of any help to you just drop me a line at 707 North Acres Lane, Springhill, Louisiana 71075.

Fly low. □



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