A configuration that set the style for many homebuilts in more recent years, the Stahlwerk appeared in 1922. A natural for flying scale modelers.

STAHLWERK

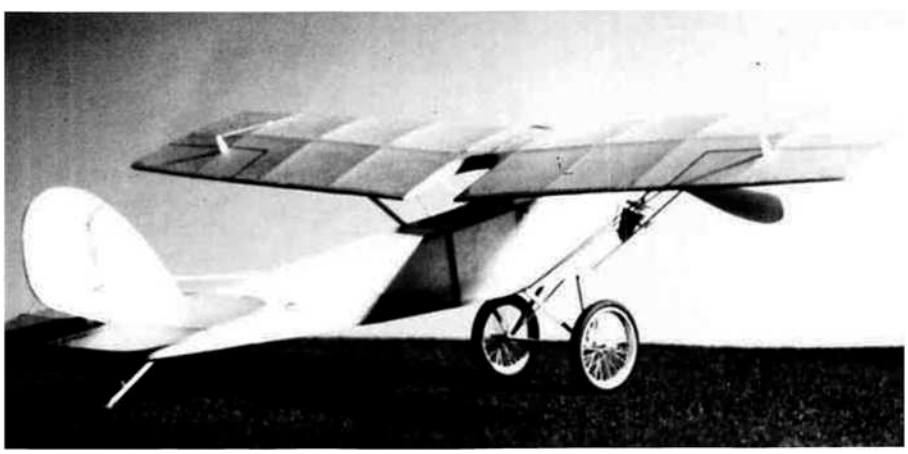
What true modeler hasn't, at some time or another, started with nothing more than a pair of wheels, and built a whole airplane around them? This little parasol is a natural for rubber scale. By Walt Mooney

This is an airplane that I had seen pictures of from time to lime over the years, but had never had a three-view from which to make a drawing. Thus, as a model, it was put off for years. When button Hungerlord came out with his spoked wheels, I got hold of a pair of them and spent some time looking for the ideal scale to put them on. Not too long ago, in a Polish magazine, I found a three view of the Stahlwerk monoplane, and in no time, this model was in the works.

The Stahlwerk is a classic configuration, first conceived during WW I, and still being built today by many homebuilders, in the form of the Pietenpol and the Baby Ace. The high wing parasol monoplane has been with us almost sixty years, so I suppose it's safe to predict that it will still be built as a full size aircraft as long as homebuilders continue to want to build cheap, sale, open-cockpit airplanes.

The Stahlwerk is something of an antique; it was flying in 1922. It obviously used war surplus wheels and they look overly large for the airplane, which adds to the model's charm. The three cylinder, uncowled motor allows cylinder detail on the model without making the motor the major part of the project.

This model was built out of my scrap box. It was surprising how little material it actually look to make it. Six pieces of one sixteenth square eighteen inches long, one piece of sixteenth by eighth, fifteen inches of one sixteenth dowel, a few square inches of thirty second and sixteenth sheet, a couple of small blocks of eighth sheet, a loot of thin piano wire, a piece of six louth plywood (one inch wide by six inches long), wheels, cylinders and prop, a quarter lube of cement or less, half ounce of dope, same of thinner, two feel of monofilament line, two square inches of black tissue, and about a third of a sheet of white tissue will do the job and leave a little to put back in the scrap box. The use of a plastic propeller, Hun gerford wheels, and Williams Brothers cylinders, simplifies the job. Total time on this model, including the drawings and this article, but discounting water and dope drying times, which look place at the end of a building session, was twelve hours. My actual building time was eight hours. Of course, I was pushed a little by my illustrious editor's schedule, and even so I probably delayed it a little.



Laminating makes those rounded tail surface outlines a cinch to build, and they're strong, too. Little touches, such as control surface lines, cables, and horns "make" a scale model.

The model flew right off the board with low power, but with more winds it required a thirty second shim of down thrust and about a thirty second of down elevator to keep the model from stalling under power at the beginning of the flight. The landing gear is pretty far aft, but even so, all takeoffs are easy. The model shows no tendency to groundloop and on smooth surfaces it lands beautifully. The least little obstruction results in a nose over, but because of the light weight the model is immune to damage from I light-caused accidents. The best flight to date was a scary, above the rooftops 50 seconds, after a takeoff from the nearest street intersection.

The model construction is much the same old thing, for the most part. The fuselage is a square box with the two sides built over the plan first. All the fuselage forward of the wing is built out of block or sheet.

There is no need to try to keep the nose light, however, try to keep the aft end of the model light. The bottom of the cowl has some curvature to it and may require welling to allow that much bend, or use two layers of thirty

second sheet, if you desire.

The wing and tail structure is simply assembled over the plans. The only thing that may require some effort is the tail outline. This laminated outline looks very good, is strong and light, but it takes a little more planning. If you think this will give you trouble, just cut the tail surfaces out of light thirty-second sheet balsa and make the model even simpler than it is on the plans.

For the tail outline, cut out patterns from one eighth sheet to the shape and size of the inside of the outline. Sand the edges to make sure there are no sharp corners or rough spots on these forms. Then wax the edges so that glue will not stick to the forms. I use color crayons for this waxing because it's easy to see that the job is complete. Select firm springy thirty-second sheet balsa for the outline and sand it smooth with fine sandpaper on both sides and blow it free of sanding dust. Now slice off several one sixteenths widths. Thin out some white glue 50-50 with water to use as a laminating adhesive. Gel some masking tape and tear off half a dozen one inch lengths and put them easily at hand. Now coat one side of one of your sticks with the adhesive, place a second one against it and wet the outsides of this combination. Now lay one end of this "wet noodle" on a straight part of your waxed form outline and wrap a piece of tape over it so it is held securely to the form. Proceed to wrap the balsa around the form, taping it in place where necessary. You must maintain a little tension on the part as you wrap or it will crack in a sharp break instead of bending smoothly around the form. The horizontal tail outline may be made in two halves or carefully lapped during lamination for a one piece outline.

After the outlines are thoroughly dry, they can be carefully removed from the form and set on the plans where the rest of the tail assembly is made.

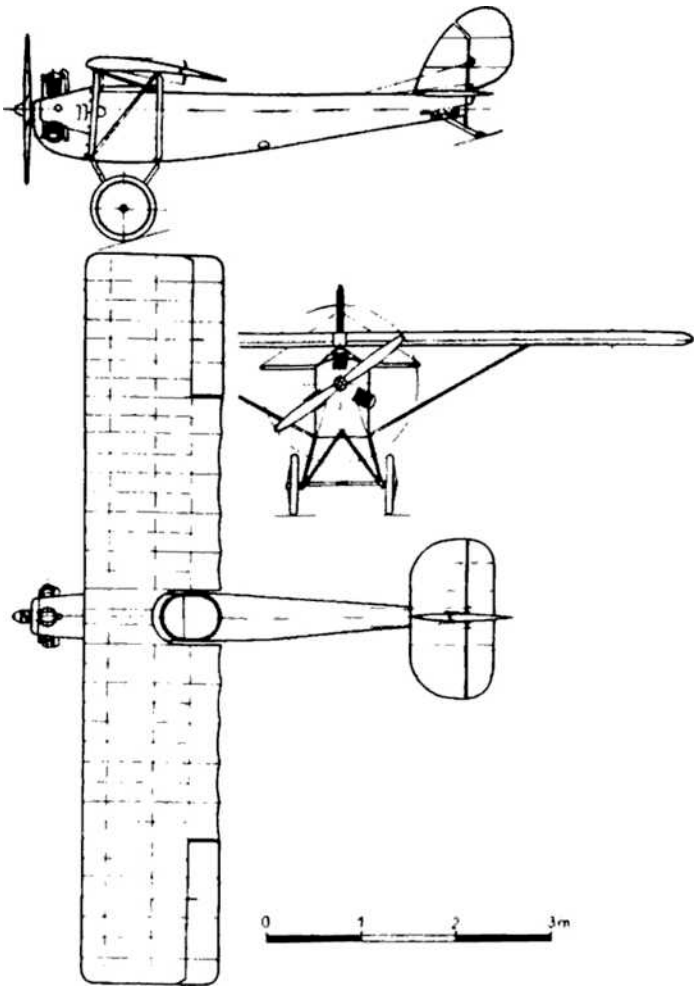
Don't forget the gussets shown on the wing drawing. At the center wing cutout the rounded gusset is actually three thicknesses of one sixteenth balsa to go the full wing thickness. Lean the top of the center ribs towards the lips enough to give the dihedral shown in the front view. Alter the wing assembly is dry, remove it from the board and cut it apart at the center. Make the spars smooth with respect to the center ribs and cement the two halves of the wing together at the right dihedral angle.

Covering is strictly the same old pro cedure. Apply adhesive only around the outlines of the parts to be covered. I use thinned out white glue and it works well. One exception to the outlines only rule is the undercambered lower surface of the wing, where adhesive must be applied to all the ribs. The model was given one coat of thin dope all over after the tissue had thoroughly dried from its water shrinking. The cockpit opening and the step hole were simulated on the model with black tissue and the fuselage was given a second coal of dope.

Check the little Stahlwerk against the three-views and you'll see that Walt made very few alterations to the scale outline. The narrow landing gear tread has no effect on ROG's.

Details such as the india ink control surface outlines, the engine cylinders and the louvres are added next. The cabane struts and the landing gear struts are made of one thirty second ply. This is two layers of sixty fourth ply laminated. Install the wire landing gear strut first, then build up the wood struts to match the plans. Note that the wood struts are not cemented to the wire ones and thus do not support the airplane. The wire can therefore spring under load and absorb the shock.

The cabane struts arc installed by notching the top coaming to take them. After they are dry, cut a small V notch in the center of the wing where they will attach and cement the wing in place. Block the wing tips in the proper position and cut the main wing struts to length from one eighth wide strips of sixty-fourth ply and cement them in place. Install the tail and the wheels and then the propeller.



The model is now complete except for the control wire and tail brace details.

Cut the control horns from little scraps of ply. Poke pin holes in the tissue where the wires penetrate and cement the ends of the monofiliment line in place. When these are dry, cement the other ends to the control horns. The same technique is followed for the tail brace wire. Make sure there is a dry drop of cement everywhere the line penetrates the tissue. You can now tighten the wires by holding the model over a source of heat. I use a burner of the kitchen stove for my heat source, and I always hold a hand between the flames and my model to make sure I don't eliminate the model at this point!

A single loop of one eighth flat rubber is adequate power…