

PHOTOS BY FUDO TAKAGI

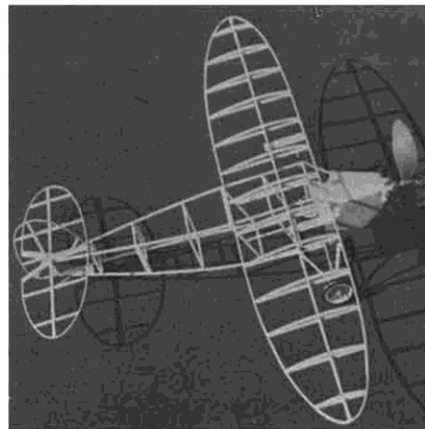


LUBLIN R-XII

By WALT MOONEY . . . An interesting Polish Peanut with out-of-the-rut lines. Elliptical outlines are easier to make than they might appear.

- The Lublin R-XII is a simple-to-construct scale model airplane, with excellent aerodynamic characteristics. It has a rectangular cross section fuselage, which is about as simple as they come. The wing and tail surfaces have elliptical planforms, which are theoretically as efficient as can be designed for a subsonic airplane. It also has a cantilever wing, which results in a very low drag configuration. The wing and horizontal tail are located on top of the fuselage, which makes for simple, accurate assembly. About the only draggy items on the design are the landing gear struts, the engine cylinders, and the horizontal tail struts.

The model has been built with only three intentional deviations from exact scale. The horizontal tail has been increased in area to help the flight characteristics, and the landing gear length has been lengthened slightly to increase the diameter of propeller that will clear the ground on R.O.G. takeoffs. One other deviation is that although the wing is built flat over the plan, after it is covered and the tissue is shrunk, it warps up to give about 3/16 of an inch of dihedral at each tip.



Extremely light and simple structure shows up well in this photo. Uses sliced ribs.

All the aerodynamic surfaces are built directly over the plan. The tail ribs and spars are made from 1/20 square balsa. The bottoms of the wing ribs are also made from 1/20 square. The spar is cut to the shape shown from 1/20 sheet balsa, and the tops of the wing ribs are sliced from sheet also.

The surface outlines are the most unusual construction details associated

with this model, and the method of making them will be taken up in detail.

Start making the surface outlines by cutting out a pattern for each surface to the inside of the outline. If you have some cardboard about 1/16 inch thick, use it for the pattern, otherwise, use 1/16 sheet balsa. Make sure the outlines have smooth curves all the way around. Use a wax candle or a color crayon to coat the outline so that glue will not stick to it.

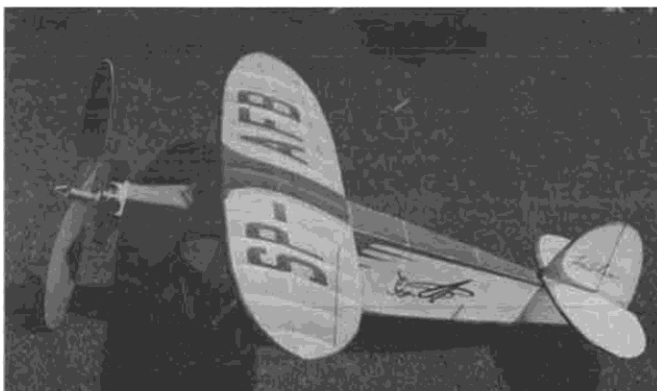
The outlines are laminated from strips of basswood 1/20 inch wide by .012 inch thick (this material is available from Peck-Polymers). Laminate the outlines using thinned-out white glue for an adhesive. Also, wet the sticks so that they will bend easier. Use masking tape to hold the laminations to the forms. It's best to cut about twenty half-inch squares of masking tape before beginning the lamination and stick them lightly to the edge of the workbench where they can be easily detached and handy for use.

Two pieces of basswood are used to make the tail surface outlines. Wet both sticks with water and shake them off so they are damp, but not dripping. Now apply a coat of white glue to one side of one of the sticks. Put the second stick against the first with the glue between. Starting at the trailing edge centerline of the horizontal tail, tape the sticks to the pattern edge. Now, always keeping the sticks against the form, bend the sticks around the form. Use the masking tape to hold the sticks against the form about every inch around the periphery. Go all the way around the outline. Do not try to bend the sticks if they are not against the form, as they will just break if you do. Once the outline is attached all the way around the form, check to see that the sticks are perfectly aligned, and that the form and the outline are flat in the plane of the surface. Now let the lamination dry. It's best if you let them dry overnight.

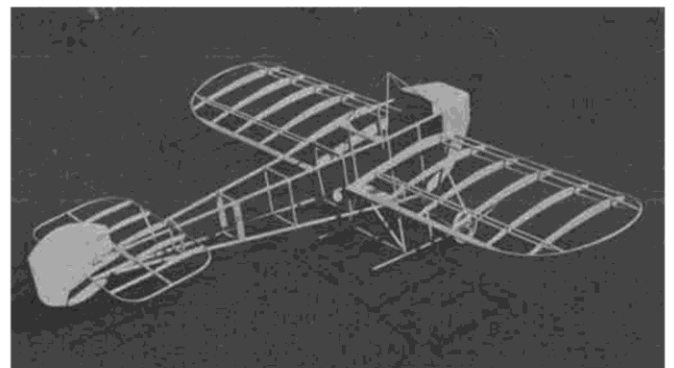
The vertical tail is done in a similar manner. Its form should extend at least a half inch in a straight line beyond the ends of the outline so there is a place for the end tapes to hold the sticks.

The wing is done similarly. However, because it is quite a bit longer around the outline of the wing, the outline sticks

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Is that a grasshopper or a half a horse on the fuselage side? If you said "grasshopper," you're wrong... see text.



Bones of a future Peanut, a Chiribiri N-5. Walt is making plans available for the prototype Fokker Triplane that didn't pan out... see "Workbench" column.

will have to be spliced. It's best to make a little more than half a wing outline twice. Also, three rather than two sticks were used on the wing on the model in the photos. It is showing a little sagging between the ribs, so four sticks are recommended for future models. The fourth stick can be run inside the others from the tip rib inboard to the center. It won't be needed at the tip where the bend is sharper, and besides, it would make it more difficult to achieve the tip bend.

After the laminations are dry, they can be separated from the forms and pinned down over the plans. Use care in removing the outlines from the forms. Sometimes in spite of the wax coating on the outlines of the forms they will stick a little. If you are impatient getting them off, you may find yourself starting a new set. Now put the spars and ribs in place in the tail structure. Put in the lower ribs and then cement the wing spar in place on top of the rib bottoms. Take the sliced top rib caps and trim them to fit, then cement them in place on top of the rib bottoms and the spar. Add a piece of 1/20 square balsa on top of the wing leading edge to provide the extra depth necessary to get the correct wing airfoil at the leading edge.

While the surface assemblies are drying completely, start the fuselage by building two fuselage sides directly over the plan. Except at the rear motor peg location, where a 3/16-inch wide stick is used, all the uprights and longerons are made from 1/20 square balsa. The fuselage sides forward of the front door are made from 1/20 sheet balsa. When the sides are dry they are removed from the plan and separated by carefully sliding a thin razor blade between them. Cement the sides together at the very rear end, and using the top view as a guide, cut and install the 1/20 square balsa cross pieces. Add the one triangular front former and then the 1/32 sheet balsa top and bottom forward covering. The grain of the bottom covering should go crosswise to the fuselage. The top covering forward of the windshield should have its grain lengthwise to the fuselage and will be in two pieces joined on the fuselage centerline.

A smooth, accurate structure is very important if a smooth covering is to be obtained. This requires a lot of careful sandpaper work. This is especially true with the thin laminated surface outlines. Sand the leading and trailing edges to the proper cross section. Don't hurry. Use a fine sandpaper, such as 320 wet-or-dry, or even finer. Coarser paper will tend to catch on the outlines and tend to pull the structures apart.

The nose block is the basic engine crankcase with a backing block that fits snugly into the front end of the fuselage. A small Peck-Polymers nylon thrust bearing is used and five of the small Williams Brothers cylinders are also used. For simulated cylinder heads, use black 000 size snap fasteners (dress snaps).

Covering the model follows standard practice. Use lightweight tissue. Each surface can be covered with a single sheet for each side. You may find it necessary to cover the wing top with several pieces, but it was accomplished on the model in the photos with just one.

Only one Lublin R-XII was ever built, so there is only one accurate color scheme. Bill Hannan and I spent quite a bit of time trying to translate the color scheme from Polish into English. We are sure that the fuselage top and bottom and front on the sides is red. The side pattern is as shown. The surfaces also have red trim as modeled. The rest of the airplane is described as "beige," although the wing may also be left the color of plywood. What I suspect is that the original airplane was covered with linen cloth and clear doped. The plywood wing covering would also have been covered with linen and so would have a slightly different color than the rest of the fabric. Then the red trim was added. We used white tissue for the body and tail surfaces, and a pale yellow for the wing. The top and bottom of the fuselage is red.

Wing lettering, and the thing that looks like a grasshopper (but translates as "half a horse" . . . maybe horsefly?) is also red. Cylinders, tires, and moving surface outlines are black. The engine crankcase was painted flat steel. All struts were painted shiny red except the upper part of the vertical landing gear strut.

My model came out just a little bit tail light (nose heavy) with the plastic propeller. Ballasted so that it balanced just level when supported by the wing tips at the spar, it flew very well with a single loop of 3/32 rubber for power. Have fun with your Lublin. It's a model of a Polish airplane that certainly was as modern as any in the world in its day (1931). ●