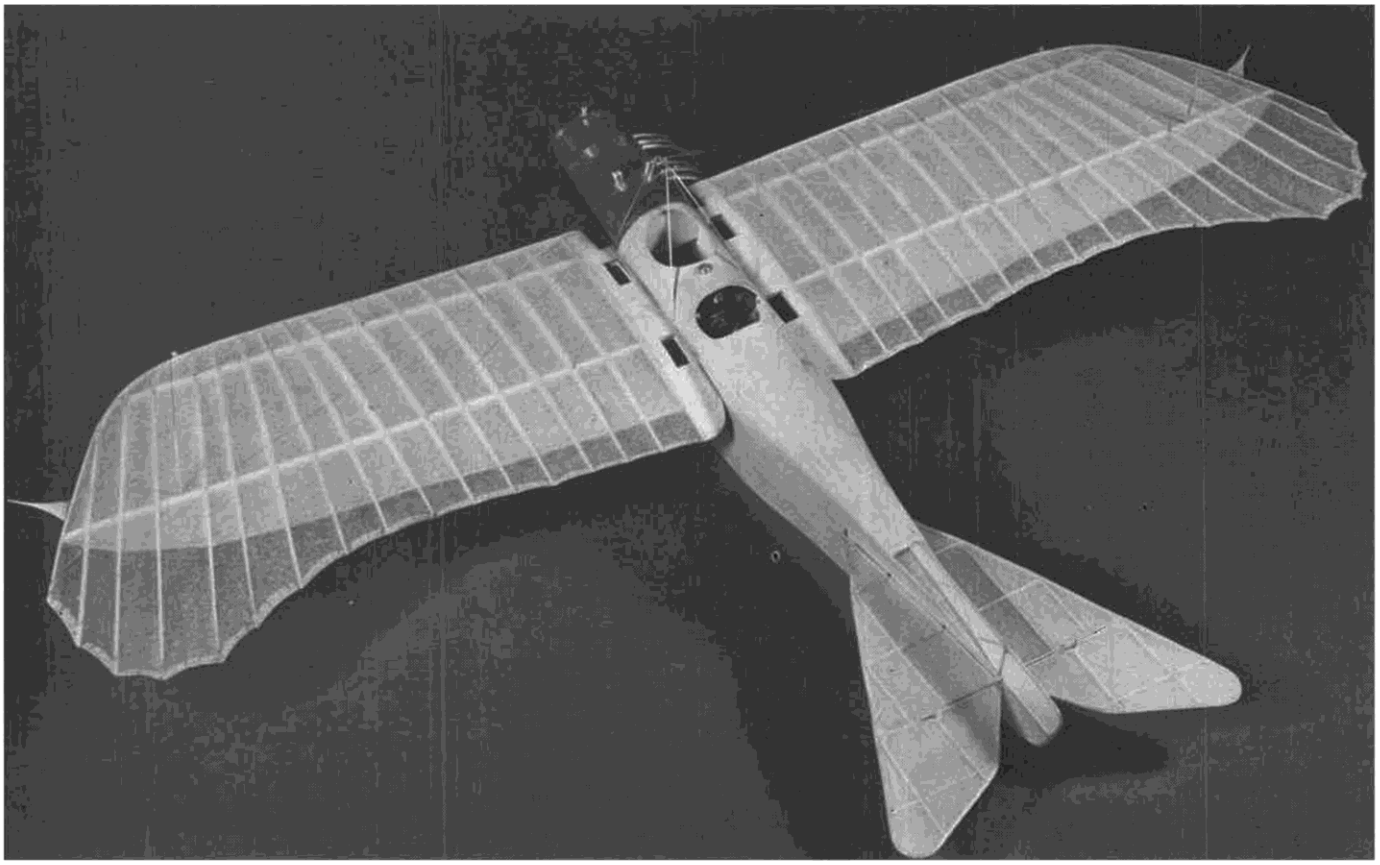


GOTHA TAUBE

By BILL STROMAN . . . Winner of Free Flight Scale at the recent Flightmasters' all-electric contest, this model illustrates the fact that electric power for model airplanes has completely arrived.

• While looking through the advertisements in the back of a model magazine last year, I came across a drawing of a Taube. As this was a pretty good drawing, and the ad promised more of these, I wrote for the catalog. Much to my surprise, Mr. Zasadney had Taubes listed that I had never heard of! Well, in less time than it takes to say, "Gothaer Waggonfabrik A.G.," I mailed away for about twelve of his 1/72 scale drawings. These drawings come in two scales, 1/72 and 1/24, and you also get a written description of the aircraft and, if known, the dimensions. This is my first model made from Zasadney's drawings, but I'm sure it won't be my last!

I chose this Taube because of its clean (for a Taube, that is) lines, and its character. It has a little more wing area than Astro Flight recommends for it's 02 Electric power unit, however, it's lighter than the 12 ounce maximum that they set. This is my third electric subject, and I do like this mode of power. First, it's clean . . . no fuel to soak plane, rigging, and modeller. Second, it's fun to just flip a toggle switch to start it . . . no cut fingers from the props, no flooding, no priming, and no adjusting a needle valve just behind a 20,000 R.P.M. propeller. Third, it's quiet . . . one can fly this in the city without annoying the residents nearby. All in all, there's a lot going for electric-powered free flight scale.

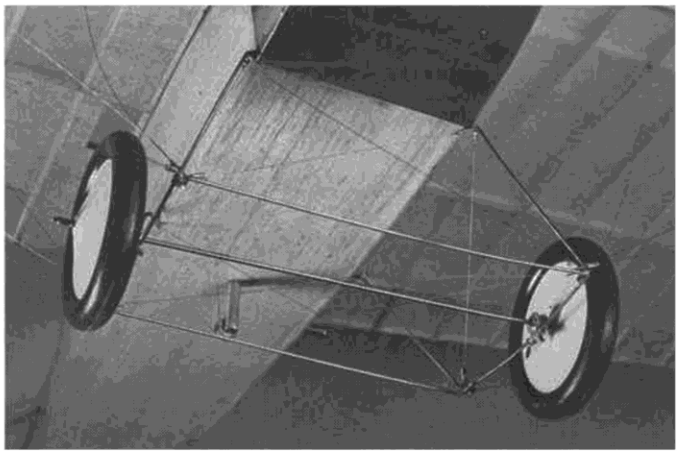
Although this model may look hard to build, it really isn't. I drew the plans, built the model, and traced the plans for the magazine in about 25 evenings. Let's start building by beginning with the fuselage as everything else must attach to this anyway.

FUSELAGE:

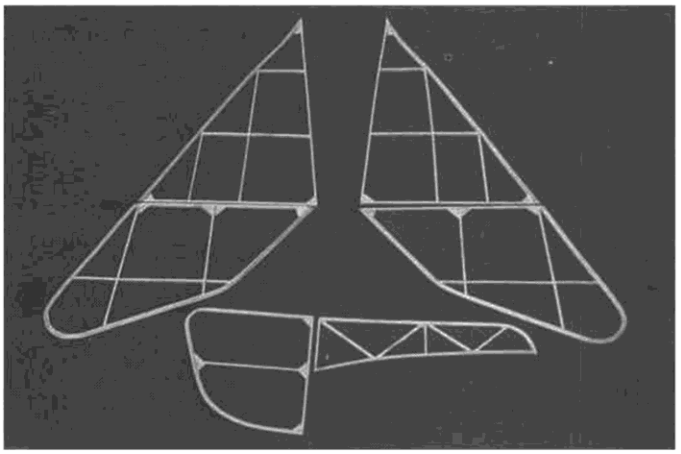
Trace and cut the 1/16 sheet sides from the side view on the plans. These go from the tailpost to under the radiator shell. Now trace and cut the bottom sheet from the top view on the plan. Cut out all the formers and the fire wall. Before installing these, you should finish off the instrument panel. Stain the balsa with a water based wood stain. When dry, add three or more coats of clear dope to get a high gloss finish. Now, drill the four holes for the instruments. Use these holes as a guide to draw four circles on a piece of white paper. Using black ink, mark some numerals and needles on each dial face. Now, glue some cellophane to the back of the instrument panel, then your marked paper behind this. Cut some 3/8 diameter brass tubing to act as rims, polish them, insert into holes to act as rims. Makes a nice looking panel doesn't it? Cut a small piece of tubing from a Hot Stuff bottle and glue on as a turn-and-bank indicator.

Now glue the back of the two sides together and insert the bottom between them. Insert the rearmost former between the sides and glue the bottom piece up to that point, continue until all formers are in. Cut and glue the firewall in place, then the 1/4 x 3/4 vertical blocks that go in front of it. Now glue in place the horizontal shelf that the motor sits on. Cut and glue the 1/8 ply wing mounting boards to the inside of the fuselage, as shown, also fit the battery in place, glue in the braces, then, when dry, remove the battery. Measure and cut the brass tubing for the undercarriage mounts and glue or epoxy in place.

Cut the top decking for the flat rear section (the grain of the wood should be crossways for easier bending) and glue this in place. Follow this with the rounded decking up to the rear cockpit. Now, butt join a sheet to this one (Hot Stuff is great for this type of joint, but



Detail photo of undercarriage rigging. Braided control line wire, .012 diameter, with flattened aluminum tube "turnbuckles."



Tail surface construction is exercise in laminated outline technique. The secret is in keeping tension as the pieces are bent around form.

be VERY careful as the drying time will not allow you to realign the sheet) and continue to the front of the forward cockpit. Cut out the holes for the front and rear cockpits, and sand everything smooth. Glue 1/4 x 3/8 balsa blocks from "B" to "C" flush with the former, just where the top of the hood will meet the screen on the sides, as additional support for the nose.

MOTOR INSTALLATION:

Mount the motor on the shelf with an aluminum clamp, being sure that the shaft will clear the radiator shell. Solder lead wires from the motor and bring them back to the forward cockpit. Following the wiring diagram in the Astro Flight box, complete the wiring and install the switch, charge receptacle, and battery. Charge the unit and test run it to see if you did everything right. Powerful little devil, isn't it?

Install 1/16 decking from forward cockpit to the end of the 1/4 x 3/4 blocks on the firewall. This will be a butt joint again, to the decking behind it. Dope all surfaces with at least three coats of clear dope. Dope inside of motor compartment black.

SHEET METAL WORK:

I obtained my aluminum sheet from a print shop. These are used on drums for printing and usually have some printing on them. I was able to get six of these used sheets just for the asking, however, the print shop owner was an ex-modeller and others may charge a small fee. The printing is easily sanded off with a 320 grit paper, then finish sanded with a 400 grit paper. Some polishing compound can be used after this to obtain a good bright finish.

Make the side pieces first by laying the sheet next to the fuselage and scribing the outline on the metal. Cut the piece out with old scissors or small snips. Lay out the six louvers and cut the slots for them with an old X-acto blade. Using a stylus or rounded piece of wood, form each louver. Lay the sheet against the fuselage and mark where the holes for the louvers are on the wood, remove the sheet and paint this area black. Now, carefully line up the panel and hot-glue it to the wood. Repeat on the other side.

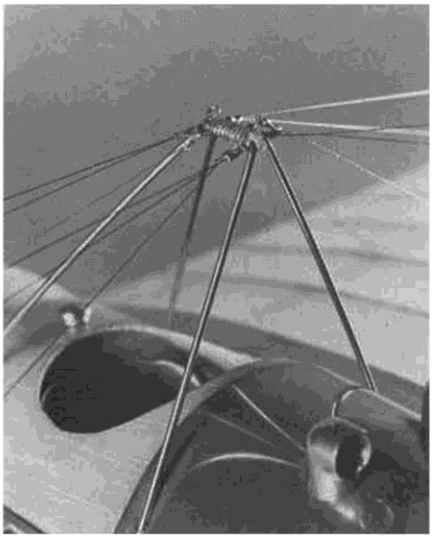
Mark the bottom panel the same way as the sides, but leave about 1/16 overlap on both side edges. Glue to bottom and fold overlap onto sides with a burnishing tool (any hard, smooth object will do). Cut a small piece that goes between the side and the hood at the front, leave a 1/16 overlap at the rear of this and fold it inward to make a neat seam.

Make the hood panel with 1/16 overlap on both sides and install. Cut the forward air scoops from sheet, form them by rolling a dowel over the sheet until enough curve is made and glue to the hood.

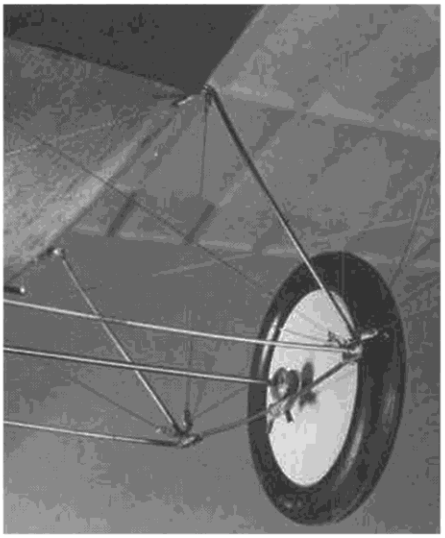
The ship-type vents at the rear of the hood are sort of a problem. Mine were made of aluminum. One end of a 1/2 inch square stock was turned on my small lathe to a 3/8 diameter. Then the opposite end was hand-filed to shape. To improve the looks, and also to lighten it, 1/4 inch holes were drilled from both ends, and the outside was polished. The hood then had two 3/8 diameter holes drilled in it, and the vents glued in place. If this seems like a lot of work, or you don't have a small lathe, make the vents of balsa or pine, seal and paint them silver, and they will still look great.

The radiator sheel is something rather different from most models. It can be made from a block of balsa, sanded, and painted. The one on the original model was made from .02 aluminum sheet, and wasn't as hard to make

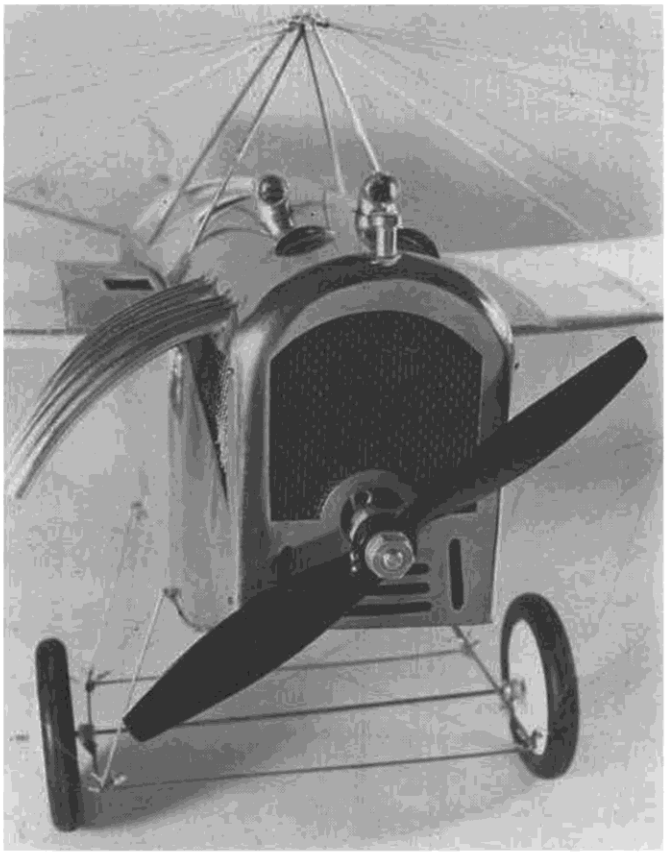
The Astro Flight 020 electric motor is simply strapped to the mounting plate.



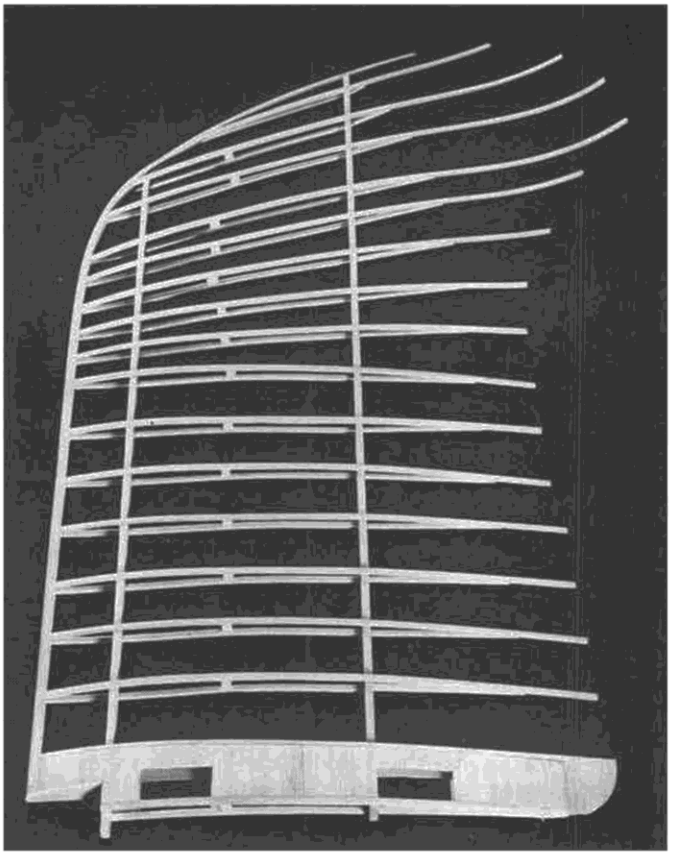
The local meeting place for all the rigging is right above the pilot. Keeps it all in sight!



Close-up shows how axle is laced to runner with rubber strand, for shock absorbing.



Front end with all the metal work in place. Radiator shell is banged out in hardwood form. Cowl is sheet aluminum from print shop.



"Boy, the cats sure picked that fish clean!" Don't worry, it's not as tough to build as it looks. Read about how it's done.

as I thought it would be. I used the firewall as a template and drew an outline on a 2 inch thick piece of fairly hard wood. Then I cut a recess in the wood using a gouge and chisel to half inch depth.

Buy a sheet of annealed .02 aluminum at your hobby shop and lay it over the block. Start forming the sheet in the recess with a small ballhammer. Do this with light taps and every now and again hold it over an open flame (stove burner is good) to anneal the metal that has work-hardened from the forming. If this is not done, the metal will crack, and if you're almost done, so will you. After the sheet is formed in the block, remove it and sand and file the outer surface smooth. Lay out the openings on the front and carefully drill holes, then file these to shape. After all the openings are finished, polish the piece with polishing compound or a buffing wheel.

The screening at the sides and front is aluminum window screen. A nickle bought enough for three of these models! Cut it slightly oversize and press into the sides and hot glue. Put the screen behind the radiator shell and glue it in place. The original model had the screen painted black *before* putting it in... seemed to improve the looks of it.

CABANE PYLON AND UNDERCARRIAGE

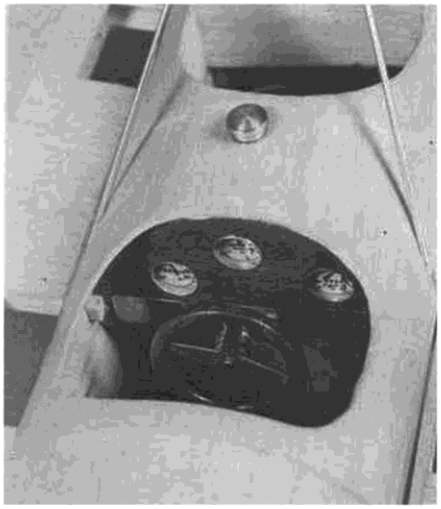
Make two pylon wires from the side view of the plans. Bind them together at the top with annealed iron wire, form a loop at each end as a guide for the front and back wing rigging wires. Place the pylon over the fuselage to obtain the proper spacing, and solder it. Use epoxy or Hot Stuff to hold pylon in place on fuselage.

Bend the side wires for the undercarriage from the side view, be sure to bend the ends to that they will fit in the tubing in the fuselage. Place wires in fuselage and bend cross wires, bind to side wires with annealed wire (once again make loops to guide flying wires), and solder. Bend small 1/16 wires that hold rubberbands to axle, and bind and solder in place. The small aluminum pulley-shaped guides shown were turned on a lathe, and help index the rubberbands when they are slipped on the axle. These are not necessary, but do make a more workmanship job of it.

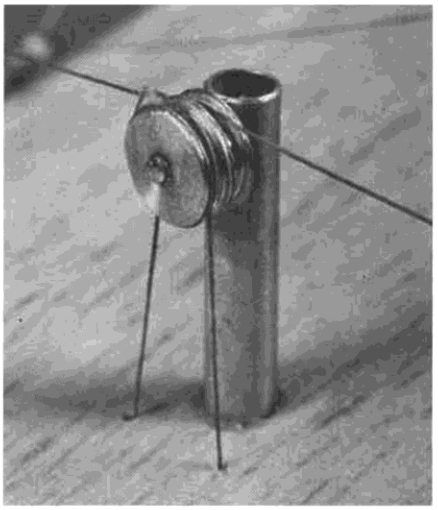
TAIL FEATHERS:

The outlines of each of these surfaces is traced on a piece of cardboard. This is cut and used as a laminating template. It is best to soak the pieces to be laminated in warm water for about 5 minutes prior to laminating. This makes the wood more bendable and the chance of breakage is reduced. I used white glue, as the set up time is longer, thus giving more time to pull the wood around the curves. By the way, that's the secret of laminating, keep an even tension on the

Continued on page 72



A little easier to understand than the cockpit of a DC-10! Not even a clock.



This pulley transferred steering wheel effort to wing warping control wires.

Taube . . . . . *Continued from page 43*

wood while wrapping around the template.

After all the outlines have dried, place them on the plans and put in the straight pieces. Keep the rudder separate from the vertical stab until after covering, the same goes for the elevators and the horizontal stabs. Coat all surfaces with at least three coats of dope, or until a gloss can be seen on the dried piece, and cover with tissue. Shrink tissue with a water mist, and when dry, coat with two coats of 50% dope and 50% thinner mixture. Let dry for two days and check for warps. If any are found, hold over a low heat and bend them straight.

Glue vertical stab to rear of fuselage, checking for alignment as you go. Now glue rudder to vertical stab at the top, where the vertical stab meets the fuselage, and put a drop of glue at the bottom. Use a cellulose cement to do this. If you need to adjust for a right or left turn, just warm the joint with your breath and bend the rudder. Spot-glue the elevators to the horizontal stabs the same way. Glue them to the fuselage sides and mount the angled bamboo struts in place.

WINGS:

Now don't start screaming and waving your arms! The wings are not as bad to make as you think! Laminate the leading edges and allow them to dry overnight. While these are drying, make the "A" and "B" rib templates of cardboard, or place a row of pins over the outlines on the plan. Take one piece of 1/32 x 1/16 basswood and one piece of 1/32 x 1/16 balsa and bend to shape. I used Hot Stuff to glue these as it saved much time, however, one could use other glues, it would take longer, though. Pin the piece in place and glue. While this is drying, bend a rib on the other template and pin it in place and glue it. Now remove the first rib, admire it, and pin another one in it's place. Soon you will have all the ribs made. *(Less admiring will save time. wcn).*

Remove the leading edges from the plan and sand them to shape, I use a fingernail emery board for this operation . . . works rather well. Pin the edges back in place and glue each rib to the top edge of the leading edge (see plan). It is best to measure the rib length over the plan prior to gluing and cut the excess from the *rear* of the rib. Cross-pin each rib at the rear to keep it in line on the plan.

Now slide the spruce stringers under the ribs, shim them up to touch the ribs and glue in place. Be sure to leave about a 1/2 inch protruding from the wing root to fit into the fuselage. After this has dried, remove the wings from the plan and put the 1/16 thick spacers in place on each rib. Now glue the 1/32 x 1/16 bottom ribs in place, noting that they are in two pieces, one from the leading edge to the rear stringer, and one from the rear stringer to where the bottom covering ends. Glue in the 1/32 sheet at the wing root, noting the direction of the grain shown on the plan. This sheeting is done on the top and bottom, by the way. Cut the holes in the sheeting where shown and sand the whole works smooth.

Start the trailing edge on the bottom first, by gluing and tying grey sewing thread where shown on the plan. Keep this thread fairly tight, but not so tight that it won't bow a little with slight finger pressure. Do the same with the top trailing edge. Dope both wing structures with at least three coats of dope and prepare to cover.

Cover the bottom surface first. Be very sure that the dope soaks through the tissue on this surface, as the underchamber has a tendency to pull the tissue away when it is shrunken. The trailing edge is done by leaving a 1/4 inch piece of tissue past the thread, then making slits with a razor, back to the thread (about 3 or 4 slits between each rib). The tissue is then folded over the thread, creased with your thumbnail, and doped on to the covering.

The top covering is done next, this is done in much the same way as the bottom, but shouldn't be done in one sheet. I found it best to cover all the "A" ribs with one sheet, then use another to cover the "B" ribs. This is done to avoid wrinkles and is easier to handle. Lap the forward end of the tissue over the leading edge (making slits as on the trailing edge) for a better looking wing.

Spray the wings with a water mist, and let dry. Coat with two or three coats of 50% dope and 50% thinner and check for warps. Check on plan where rigging wire goes through the stringers and drill these places with a number 75 drill (model train shops carry these if you don't have one). Make and glue the kingposts in place on each wing, cut a slot with a razor at the top of each to put the thread in later.

Put the wings in their sockets on the fuselage and brace the ends up one inch higher than the root on each side. Take the braided wire and put a 1/4 inch long piece of 1/16 aluminum tubing on it. Thread the wire around the tip tylon at the front and place the end through the tubing again. Flatten the center of the tubing with pliers and put a drop of Hot Stuff on it to play safe. Now thread the other end of the wire through the rigging point on the wing NEAREST to the fuselage and down to the front rigging point on the under-carriage. Slip an aluminum tube over the wire, pull the wire around the undercarriage and thread through the tubing again. Flatten the tube and glue. Continue to the next rigging point and back to the pylon on top. Be sure to thread the rigging wire through the loop of annealed wire and *around* the 1/16 wire for support each time. Do this on both sides, then do the same thing with the rear rigging wires. Check that each wire is tight, it should twang when plucked, and check angle of wing (a little wash out is OK . . . but no washin please!). If all is in good shape glue the wires to the stringers.

Cut, dope, and glue the outrigger to the ends of the wings. Tie and glue a thread from the leading edge to this and continue to the trailing edge as shown on the plan. Mark the points where the warping wires go on the outer six ribs and drill a hole on each for the thread. Make the pulley on the leading edge and pin and glue it in place. Align it so that the thread will pass from the kingpost through the pulley and down to the steering post, glue at pulley and steering post. Tie a thread in the hole at the end rib, glue it, and thread it through the loop on the kingpost, then down through the hole in the rib nearest the fuselage, tie and glue. Go to the next set of ribs and do the same, now all the rigging's done on the wings!

Use the braided wire to rig the undercarriage in the same way as you did the wings. Put the axle in place, hold down the rubberbands, and place the wheels on.

Make the exhaust pipes from aluminum tubing. This can be bent by hand to the shape shown and glued in place. I would recommend that you drill a hole through the aluminum sheet and the balsa behind it to better anchor these, as they do get banged around when you're handling the model.

Get out your camera and take a few shots of your completed model, you're DONE!

Glide the model over tall grass, or something that won't damage it, until you get a flat glide. Charge your battery and try a few short flights. Increase the charge time until you're satisfied with the length of flight. Hope you enjoy your Gotha Taube LE-4 as much as I do mine!! ●