

All-balsa towline job catches thermals just like the real plane.
Learning flight trimming will be easy with this model.

SCHWEIZER 1-29



T by DAVE THORNBURG

There's a great deal to be said for a painstakingly detailed superscale model with working gyrocompass and scale rivet spacing—but every time I sit down to work up plans for such a plane, it comes out as an all-sheet profile model that is only semi-scale at best.

There's also a lot to be said for this type of plane, especially if you're not yet an expert at building models. From certain angles, sheet profiles look excitingly close to the real thing. You can build an entire profile job in an evening, so if a stray thermal carries it off to the Great Blue Gobbler on the first flight, you're not out much time or money, and you've at least had a memorable flight. You get a lot of air time out of such models, for you don't mind putting them up in less-than-ideal conditions.

The little Schweizer 1-29 has all this going for it and more. It is really a fine performer, and very easy to make fly. Though not really scale in any of its outlines, it has a cute and classically "sailplane" look, and draws a lot of comment wherever it's flown. Not even the true scale bugs seem to notice the deviations, for the real 1-29 is not a common sight—it's a one-of-a-kind design cooked up by the Schweizer folk back in the late 1950's to test the feasibility of laminar airfoils on sailplanes. The fuselage and empennage are basically the same as the popular 1-23, but the 1-23 wing is less practical for our purposes, since it tapers sharply to almost a needle point at the tip.

Construction

If you build the fuselage from two pieces of 2" wide balsa, there will be a joint right through the wing slot, as the plans show. This makes cutting the slot much easier than if the fuselage were a single sheet. The easiest way to outline the fuselage on the balsa is to lay the full-size plan over one piece of the wood, lining one edge up with the joint line on the plans. Then make shallow pinholes every 1/4" or so along the outline of the part. When you remove the plans, the outline will be clearly visible on the wood. Follow the line of pinholes with a modeler's knife or single-edge razor. Repeat this procedure for the other half of the fuselage and your 1-29 will be about 1/3 finished!

Set the fuselage aside and begin on the wing. If you can find a piece of four-in. wide Sig Tapered stock, your work is done for you. Just take a sanding block (medium paper) and round the leading edge to the cross section shown on plans. Also round off the slight point formed in milling on the top surface of the wood, about 1 1/2" back from the leading edge. Now cut the wing in half exactly in the center, using a triangle or T-square to be sure the cut is precisely perpendicular to the leading edge. This is a good opportunity to check your airfoil sanding: is the cross section

SCHWEIZER 1-29

at the cut you just made the same as that shown on the plans?

With the same medium sanding block, bevel both halves of this center joint just slightly, so that when put back together, the wing forms a shallow "V" when viewed from front or back. This is the dihedral so necessary to a model's stability; it should be about 2 1/2" on each side. The easiest way to attain this is to lay one wing panel flat on your workbench and prop the tip of the other up 5" while gluing the beveled roots together.

Let this center joint set thoroughly before moving the wing. When dry, apply a 3 x 4" piece of light Celastic or heavy silk to the bottom of the center section. If you've never worked with Celastic, it's easy. Cut the piece to size, half-fill a shallow saucer with dope thinner, pass the Celastic through this thinner "bath" soaking it completely, and flop it in place on the wood. It will dry in two to three hours. Incidentally, if you have used model airplane cement in the dihedral joint, the thinner may soften it temporarily, so be prepared.

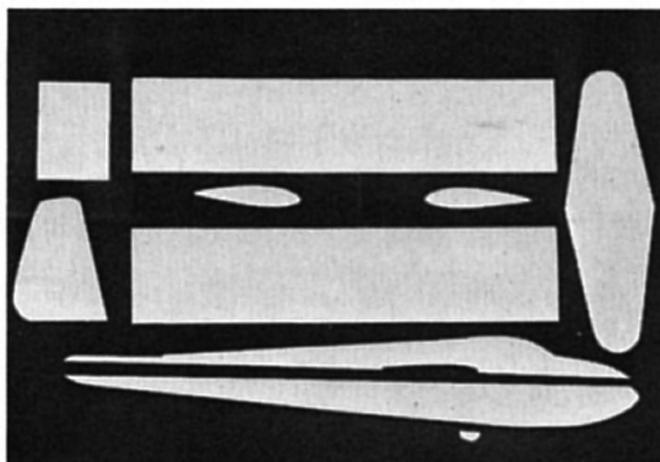
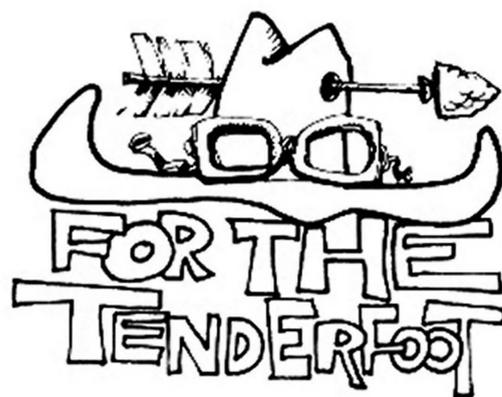
This is a good time to cut the empennage (the collective term for rudder and stabilizer) from some good, straight-grained, medium-soft 3/32" balsa. Again, pinpricking the outlines onto the balsa is the easiest method, unless you really want to cut up your plans. Round the edges of these pieces for streamlining and set them aside. Don't dope them until they're joined to the fuselage, as they're likely to warp.

You're now ready to assemble the whole airplane. Perhaps the easiest method is to glue wing and empennage to the top half of the fuselage first, jiggling everything carefully with pins and props and checking the alignment of each piece carefully. Be particularly careful in aligning the empennage; it is so far from the wing, which is the aerodynamic center of the model, that slight misalignments have a lot of leverage.

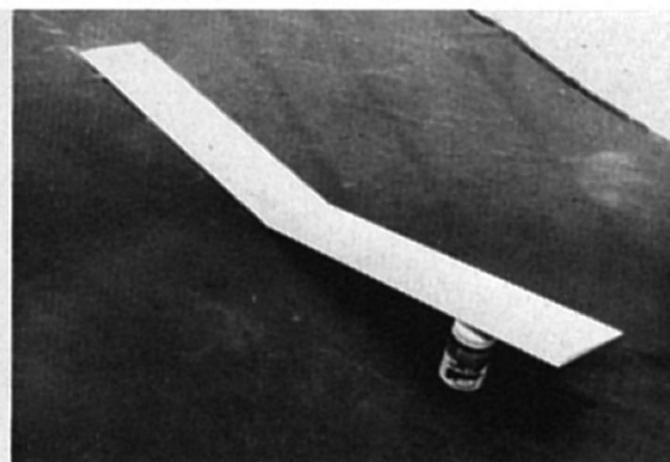
While everything is drying, you can make all of the little accessories that really "make" your model—the tip plates, for instance. Cut them out of 1/32" plywood. If you know an active modeler, you can probably find pieces of ply in his scrapbox for these and for the wheel, thus saving money. Otherwise, you might make the tip plates of hard 1/16" balsa, running the grain vertically for strength. Don't leave them off—they're worth the trouble. They act as dams to keep the high-pressure air under the wing from wrapping around the tip into the vacuum above the wing, destroying tip lift and causing a lot of extra drag. Besides, the real 1-29 has them.

Bend the tow hook from a paper clip and glue it solidly in place on the lower half of the fuselage. When the rest of the plane becomes dry enough, this lower half can be cemented on. Add the wheel and the tip plates and your 1-29 is structurally complete.

(Continued on page 66)



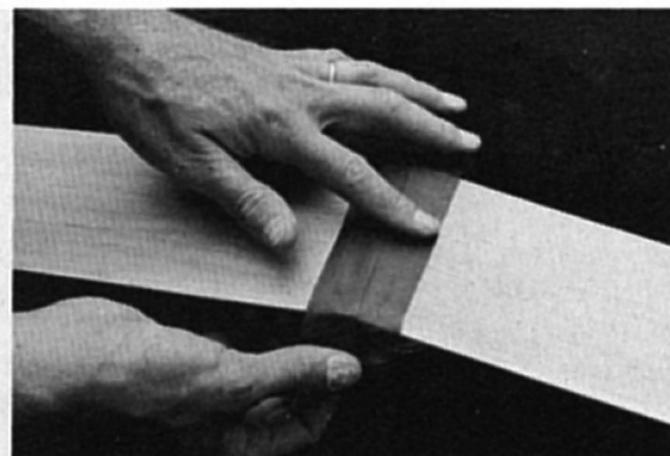
The pieces: tip plates are plywood; rectangle in upper left is Celastic (a most useful material the Tenderfoot should try) for wing center joint.



Prop up one panel 5" and glue the dihedral joint. Epoxy recommended here. Position waxed paper under the joint so your wings won't stick to the work table.



The 36-in. winged glider should weigh under 4 oz. Clay is suitable and easily varied nose weight.



If you don't have Celastic, reinforce the dihedral joint with glue-saturated silk. It is a very high stress area.

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(continued from page 48)

Fine-sand the entire plane, using No. 200 sandpaper. Rub ordinary talcum powder into every square inch of surface to be doped. Put on a coat of clear and let it dry, sand it again and repeat the process.

Now for color. The real 1-29 was white with silver wings and red license numerals. (The numbers shown are scale.) You can paint your model in this manner if you want, but you have to decide between a flying model and a display model. The pigmented (colored) dope adds loads of weight, and more than two very thin coats (not enough for a good finish) will very likely warp and overload your ship beyond any hope of good performance.

The original model had only the two coats of clear, but a few details done in India ink

added quite a bit of realism. The moveable flying surfaces, the cockpit outline, and the word experimental were all done in ink, and the license numerals were cut from red tissue. The wheel was doped black.

Flying

The balance point must be in the area shown, even if you have to put an engine on the nose for weight. Sheet lead or type metal (from a printing shop) is great, but a couple of huge washers will work equally well. Hold weights in place with a rubber band or paper clip while trial balancing; when you find the right amount, glue it in place solidly.

For test flying, find an open grassy area about as large as the infield of a baseball diamond. Grip the fuselage firmly under the wing with thumb and forefinger, aim the nose into the wind and slightly down as though it were coming in for a long, smooth landing, and gently push the plane off. It should, of

course, make that long, smooth landing. Use empennage warping to cure any violent tendencies (elevators up for dives, down for stalls, and rudder opposite of any bad turns). You might leave a wide, gentle turn in the glide, to either the right or left, so you won't have to chase the ship across two counties every time it is launched.

Now for the real flying. There are two good methods of getting a plane this size airborne. Using a towline is the most popular, but it requires two people. Make the towline by attaching a paper clip to the end of about 100 ft. of kite string or light fishing line. A small cloth or paper flag tied about a foot in front of the paper clip helps the clip drop off the tow hook when you want it to, and makes the end of the towline easier to find after a flight.

To tow the plane up, have your helper hold it as for a hand glide, but with the nose slightly up, instead of down. Hook the paper clip onto the tow hook and stretch the line out to full length, straight into the wind. On signal, both of you begin running into the wind; when your helper feels the plane lifting, he lets it go gently. The secret of good towing is to keep your eye on the plane while running like a scalded demon. If the plane starts to veer sharply in either direction, let go of the string quickly and the plane will probably fly off of the hook and into a normal landing pattern. A good tow is right straight up the line, with very little weaving. The plane ought to stay hooked as long as you continue to pull, and disengage immediately when you let the line go slack. You may want to experiment with hook positions: an inch more forward improves tows in windy weather; an inch or so back for dead calm. Tow hook offset may improve the launch, too. For instance, if a plane consistently veers off to the left on the tow, putting the hook on the left side of the fuselage (instead of on the bottom, as plans show) may help to straighten the tow.

But suppose you have no helper? He can be replaced with about 50 ft. of 3/16" rubber (from any good hobby shop) and a small stake. Tie the rubber to the stake and to the front (upwind) end of the towline. You now have a huge, gentle slingshot. Hook the plane on, as in the towline method, and back up (stretch the rubber) twenty paces for a start. Launch the plane just as the helper does in the towline method, pulling it forward and up. Make all tow adjustments just as you would for towline. As the plane smoothes out and begins to perform well, increase the rubber tension (walk back further) for higher tows.

Your 1-29 ought to be performing like the real thing. Beware of thermals, those rising air currents on warm days that wait around patiently and invisibly, hoping to snatch free flights off to the Great Blue Gobbler in OOS. Put your name and address somewhere on the plane, just in case.

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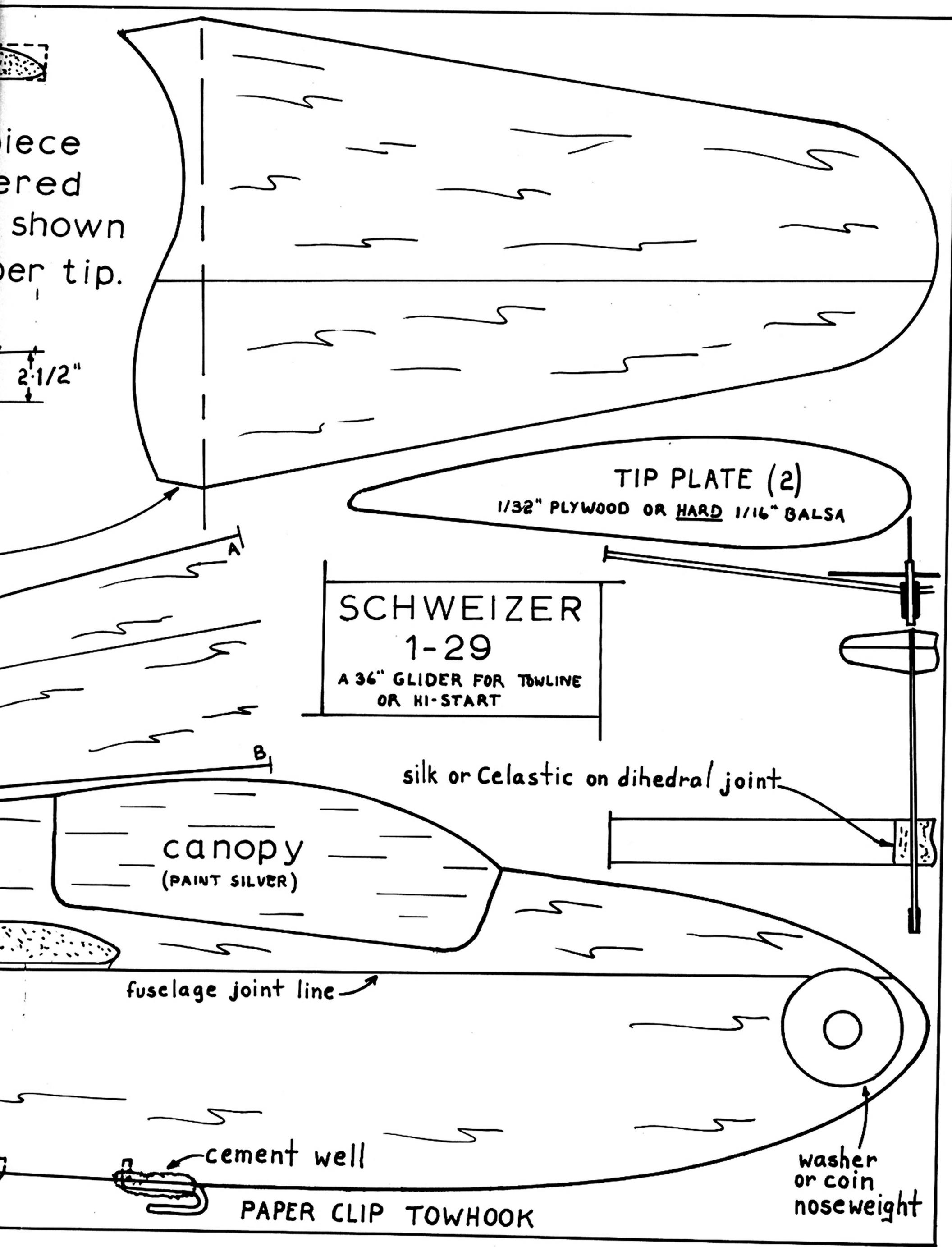
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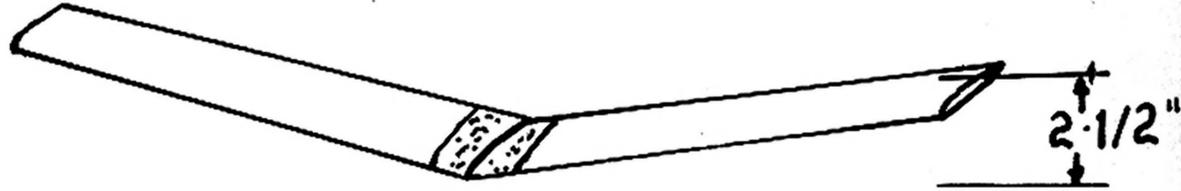
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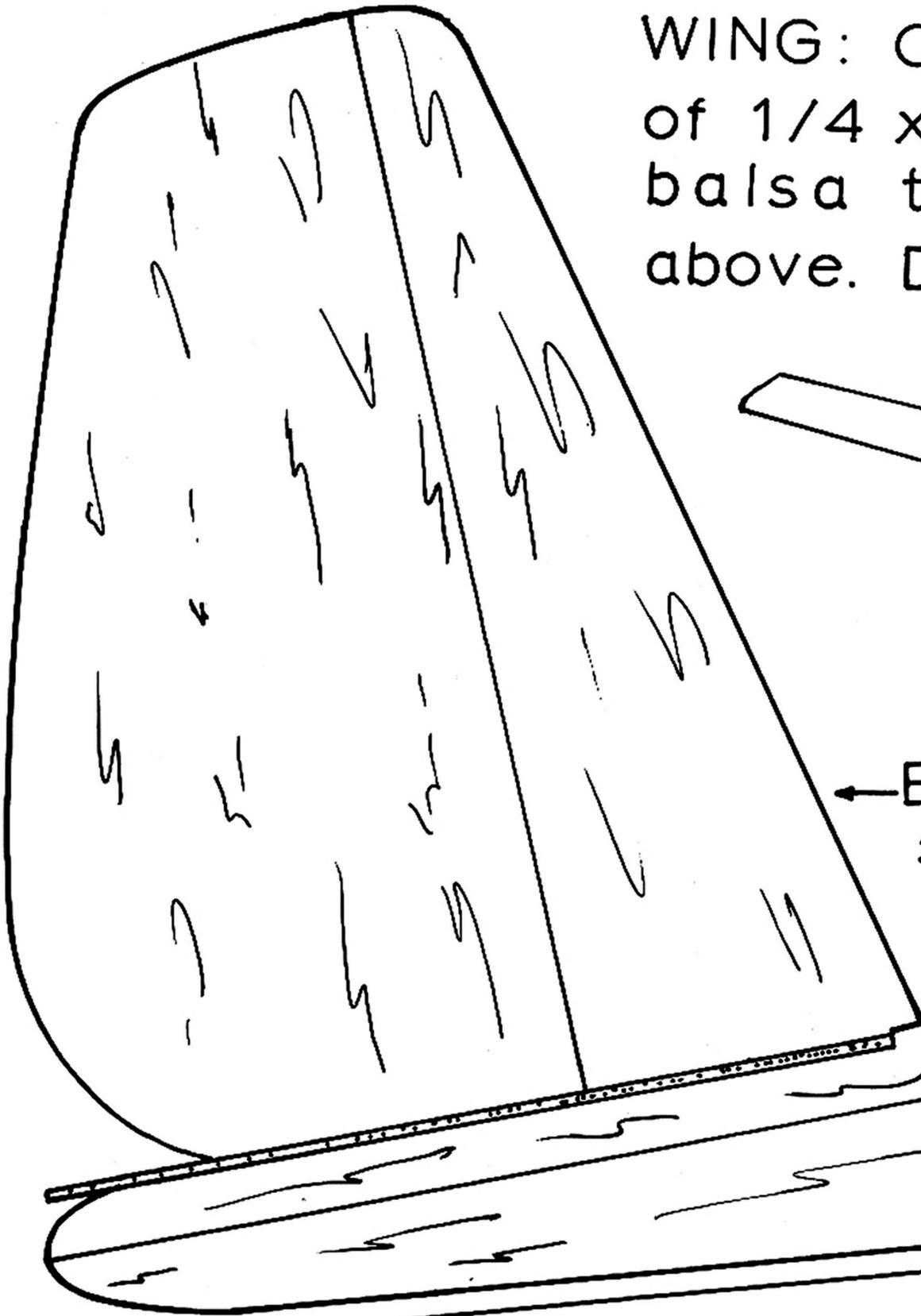




WING: Cut or sand one piece of 1/4 x 4 x 36 Sig tapered balsa to cross-section show above. Dihedral 2-1/2" per ti



←Empennage
3/32" Balsa



Fuselage: 1/4" medium balsa

r.i.p.

1/16" PLY WHEEL

