IF YOU HAVE built the SkyCrawler design (that was published in the May 2001 *MA*), you have probably had a great deal of fun with it. It is slow, stable, and does well in calm conditions (almost no wind).

I built a SkyCrawler for my brother Blake who lives in Indiana. He had never flown an RC airplane before and basically learned how to fly with this model. However, after roughly six months he started saying, "Hey, have you got anything a little faster and a little more challenging?"

That started me thinking, so I began thinking about the SkyStroller. I wanted to design a model that was basically the same size as the SkyCrawler but with a wing with much less drag. Using the same motor/propeller setup as the SkyCrawler, this model would fly faster and climb better.

Keeping the basic size and weight the same as the SkyCrawler's, it would be easy to carry in the backseat of any car and fly at the nearest park or soccer field. I also wanted to keep the design simple enough that it could be built in approximately a week, with four or so hours a day dedicated to construction.

With all those thoughts in mind, the SkyStroller was born. Let's get into building.

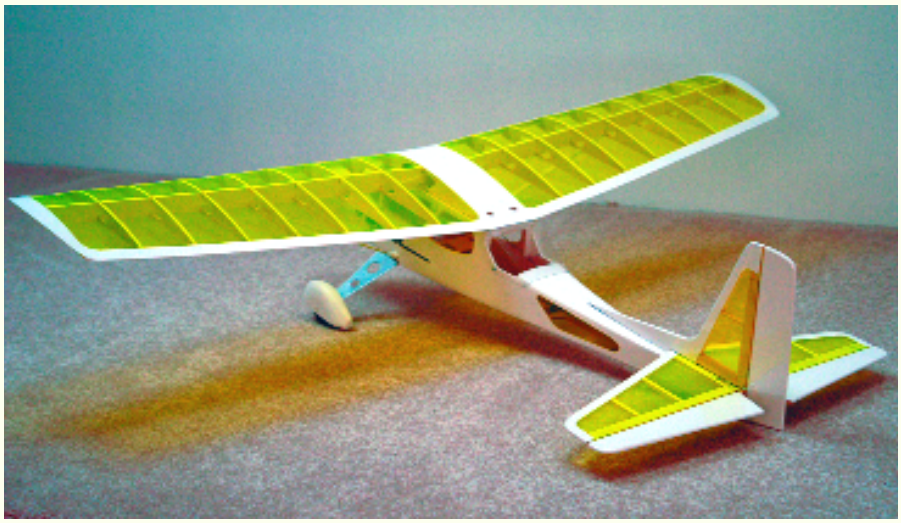
Tail Feathers: I don't know why for sure, but I like to start at the rear of the aircraft.

If you don't have a cork building board, use a piece of drywall for this phase. You will need to cut the parts indicated on the plans made from $^{3}/_{16}$ balsa sheet. I traced them onto balsa using carbon paper.

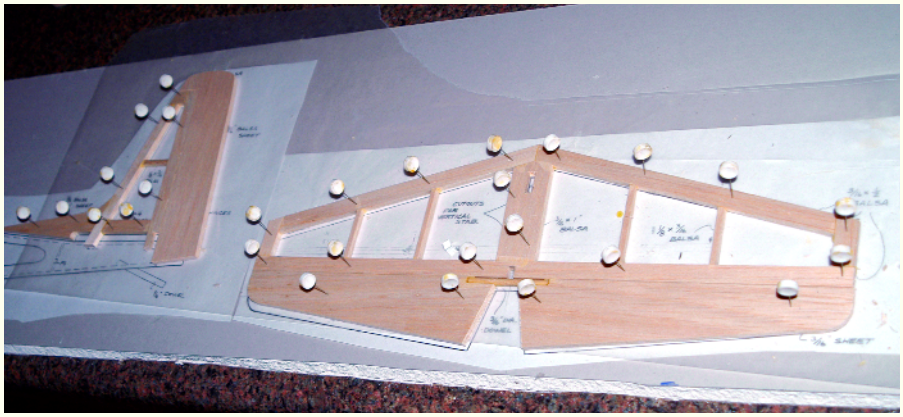
After you have cut these pieces (the dorsal fin, the elevators, and the rudder), lay them over the plans and glue them together, holding them in place with T-pins. Make sure you use the $^{3}/_{16}$-inch round dowel to join the elevator halves.

After the glue has dried, install the hinges and sand the front of the elevator and rudder to a V shape so they can deflect without binding. Do not glue the hinges in place yet, but do test-fit them. Sand the LEs of the stabilizers and the dorsal fin.

Fuselage: Working forward, the fuselage



From any angle this model is well styled and sporty. It's also easy to construct, making it the perfect first-time builder's project.



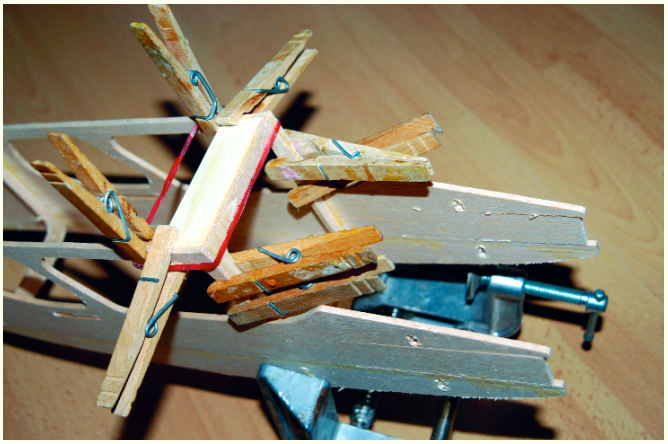
The SkyStroller's tail feathers are a combination of sheet and stick balsa. They are shown being constructed over the plans.

is next. Everything in it is made from 1/8 balsa or light plywood (poplar). I cut the parts from the plans with scissors and laid them on balsa with a glue stick.

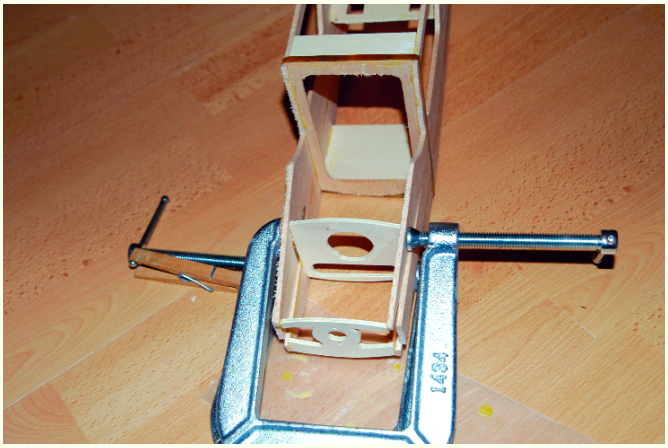
Note that many of the parts need to be made as doubles. You can easily stack the balsa and cut two at a time. Once you have done this, you may start gluing the fuselage together.

Glue in F6 and F5. Hold the rear of the fuselage together with rubber bands, and don't glue in more than those to start with.

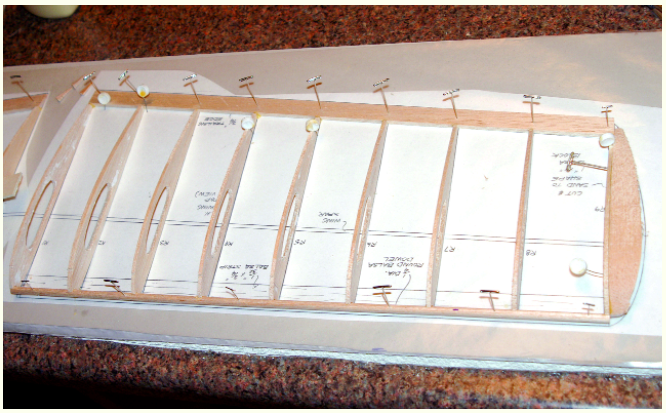
Now you need to fabricate a couple subassemblies (which are necessary to give the formers enough strength for when they are put in the fuselage later). Glue the wing mount to F4 as shown on the plans; this is the first subassembly.



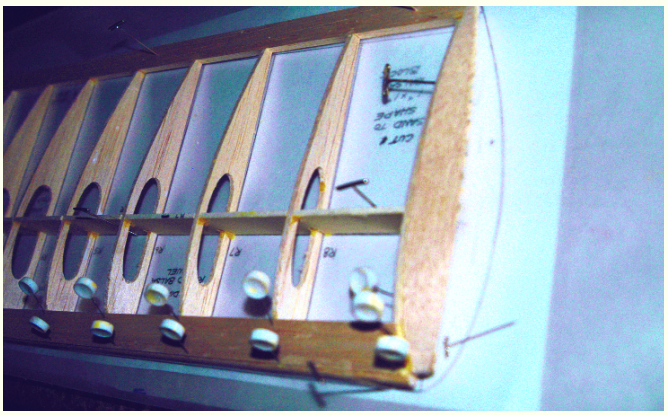
Clothespins are used to clamp the formers to the sides in the cabin area. The fuselage is all sheet balsa.



The sides are bent in a clamp to the forward formers, giving the fuselage shape. This is strong but light construction.



The basic wing is easy to build because the flat-bottom airfoil allows the ribs to sit flat on the plans.



The spar and LE sheeting are shown installed. This makes the wing rigid and resistant to warps.

Glue the landing-gear mount to the bottom of F3, and glue the forward wing mount to the top of F3 as shown. This becomes the second subassembly.

Let the subassemblies dry and then glue them into the fuselage. This is a good time to glue in the servo mount plate.

After that is dry, glue in formers F1 and F2. Make sure not to glue in the center part of F1 and F2 because this is where the cheek cowls will be later.

When that is dry, glue in the triangular pieces that form the top and bottom of the cheek cowls. Glue in the instrument panel.

When all of that is dry, sand the top and bottom of the fuselage sides to match the bottom and top of the formers. Make sure you sand on an angle to match the top and bottom of the formers. When this is done, you are ready to add the top and bottom plates of the fuselage.

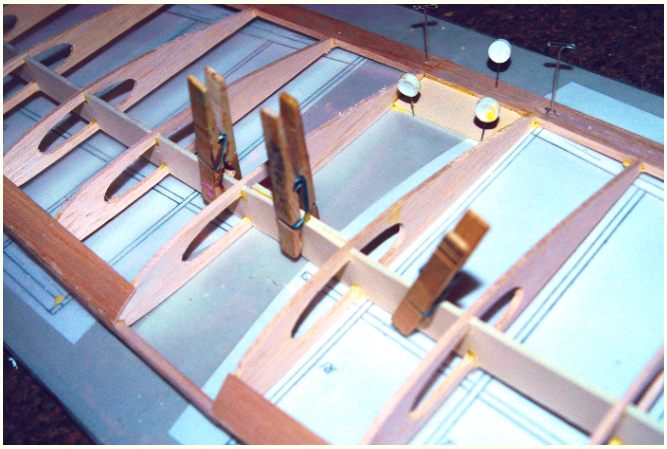
Glue the plates in, starting at the rear, and hold the entire assembly together with rubber bands. Use at least one rubber band every half inch to hold this together because the top and bottom of the fuselage are curved quite a bit. If the balsa doesn't bend easily, sometimes you can wet it on the outside surface to help it flex.

After the glue has set, remove all the rubber bands and sand the entire fuselage. Try to keep your radii consistent; this step will make a big difference in how the model looks when it is finished.

Wings: Stack the rib-stock balsa two high

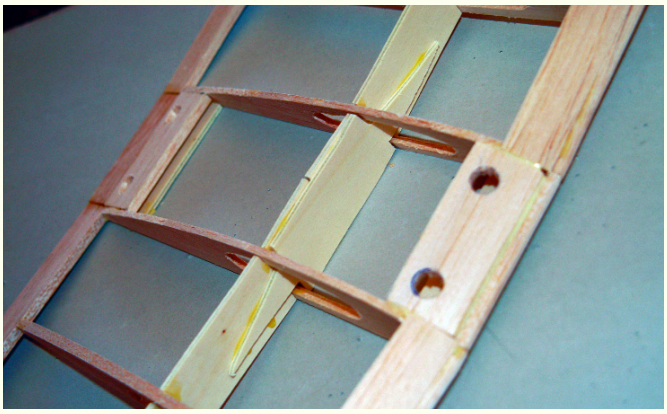
Photos by the author

The landing gear is made from flat sheet .040-inch-thick aluminum. The author polished his nicely!

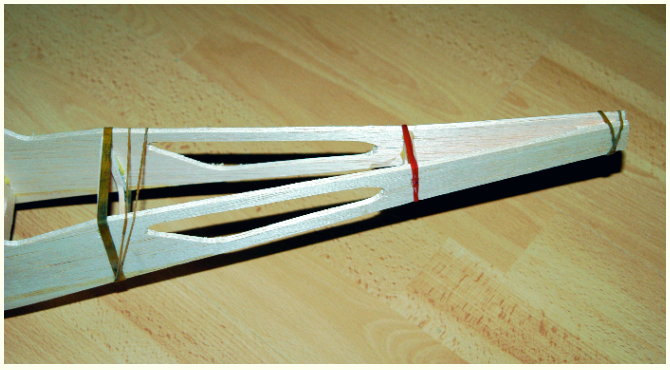


The plywood wing-spar joiner has been installed and is clamped with clothespins until the glue dries.

The 1/16 plywood wing-support strut attachments anchor to the bottom of the SkyStroller's wing.



The wing-mount bolt supports have been installed at the wing's center-section.



The aft end of the fuselage sides is held together with rubber bands while the glue dries.

and cut all the wing ribs. Do the same with the light plywood to cut the wing spars, but you only have to cut one wing joiner. When you have done this, cut the wingtips.

I traced the last rib, R9, onto the 1-inch-square balsa block to cut the wingtips. You can then sand the balsa block to a 45° angle or cut it with your scroll saw to that angle (from front to rear). Make sure you create a left and a right wingtip when you are doing this 45° cut. When you are cutting it on the angle, it is easiest to put the scrap part of the balsa block back on the wingtip that you cut out earlier (when cutting to the shape of the last rib).

It is time to start gluing everything together. Start with the nine ribs glued to the 1/4-inch-diameter balsa dowel in the front and the 3/4-inch TE at the rear. Make sure you are creating a left and a right wing. Lay the ribs over the plans and make sure they are exact.

After this has dried, you are ready to install the wing spar. This spar goes through the middle of the rib holes. If you have cut it exactly, it will rotate up into position. Hold it there with pins. You can also glue in the 1/32 sheeting at the top of the LE at this time.

To adhere the wing halves, the dihedral angle needs to be set. Glue in the wing joiner and hold it in place with clothespins or small clamps. If you want a lot of dihedral (7°), place 2 3/8-inch spacers under the R9 ribs on both ends of the wings while the middle of the wing is held flat on the table.

If you want minimal dihedral, use a couple 2 x 4s cut to 6-inch lengths under the R9 ribs. The 2 x 4 is 1 1/2 inches thick, which will give you approximately 4° of dihedral. Less dihedral will make the airplane a bit less stable but more responsive to rudder control.

At the same time the wing joiners are added, add a short piece of 1/4-inch-diameter balsa dowel at the LE of the wing and a short piece of 3/4-inch TE to the rear edge of the wing at the center.

Glue in the two wing mounts, which are made from plywood, at the front and rear of the wing. Glue in the upper balsa wing mounts that have the clearance holes.

When all this is dry, test-fit the wing on top of the fuselage. Sand the upper balsa wing mounts to the shape of the wing and sand the rest of the wing.

You can add the nylon mounting bolts at this time by drilling through the plywood wing mounts and drilling and tapping the holes in the top of the fuselage to #10-32. This is also a good time, with the wing on the top of the fuselage, to add the wing-strut mounts.

Depending on the amount of dihedral, the wing struts will be longer or shorter. The drawing shows struts for the maximum dihedral amount (7°).

Make the wing struts. Slot the ends of the struts to allow for the short threaded rods, and epoxy the threaded rods in place. Adhere the wing-strut mounts in the fuselage and to the wings at this time. Make sure the mounts are glued in at the same angle as the struts.

Wheel Pants: The wheel pants are made mostly from balsa, but the inside wall is made from light plywood. Cut the balsa and the light plywood to the pattern shown on the drawing. When the wood is glued together, make sure you are fabricating a right and a left wheel pant (which is determined by the side to which you glue the light plywood).

Sand the wheel pants until they have a smooth, beautiful shape, but don't sand so much that the wall breaks through. It will be necessary to slot the end of the 1/8-inch-diameter axles so a screwdriver can be used when installing the wheels in the wheel pants. The detail drawing shows how it all goes together.

You will probably have to drill the wheels to a 1/8-inch diameter to fit the axle. Do this on a drill press, if possible, to keep the hole straight. Make sure the wheels turn freely before you tighten the elastic stop nuts of the axle.

Covering and Final Assembly: After sanding the entire outside structure smooth, your SkyStroller should be ready for finishing. Spray-paint the front of the fuselage to approximately the first window, and mask off the rest of the fuselage. I found that three coats of paint were required to make the balsa look smooth. Sand the paint between coats.

Paint the wheel pants in the same manner. Glue a small stick to the bottom of each wheel pant; this makes them much easier to handle when painting.

When covering the tail surfaces, apply the transparent MonoKote and then the white around the edges. Do the same with the wing.

Watch carefully to ensure that you don't warp the wing when covering. If you do, you may have to twist it back to shape and reheat the MonoKote while you have it twisted. On the fuselage, cover everything except the bottom. (You will need access later when adding the pushrods.)

If you want to add the "SkyStroller" logo, the lettering is Harlow Solid Italic printed at 72 points on a sheet of Avery clear ink-jet labeling paper (number 8665). The nice thing is that after you have printed the logo onto the paper with your ink-jet printer, just peel off the backing and it will stick to the fuselage sides.

With the entire airplane covered, glue the tail surfaces to the back of the fuselage. This is a good time to epoxy the control surfaces to the tail. I learned that by applying a dab of Vaseline to the movable area of the hinge first prevents the epoxy from getting into that part.

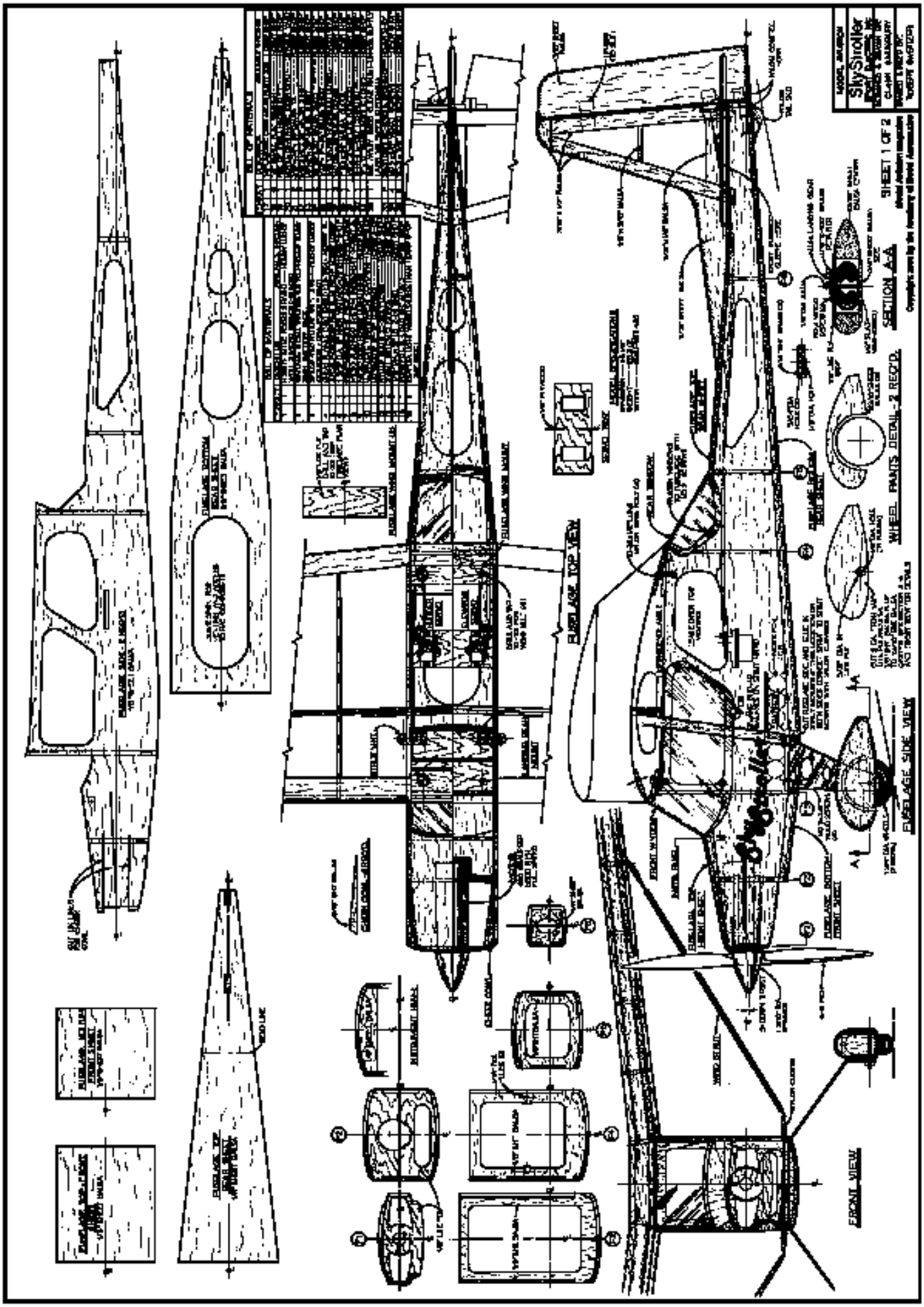
You can install the wing by making holes using a 1/8-inch drill and then tapping these holes in the top of the fuselage to #10-32 for the nylon bolts. Drill the holes in the wing to 7/32 inch in diameter.

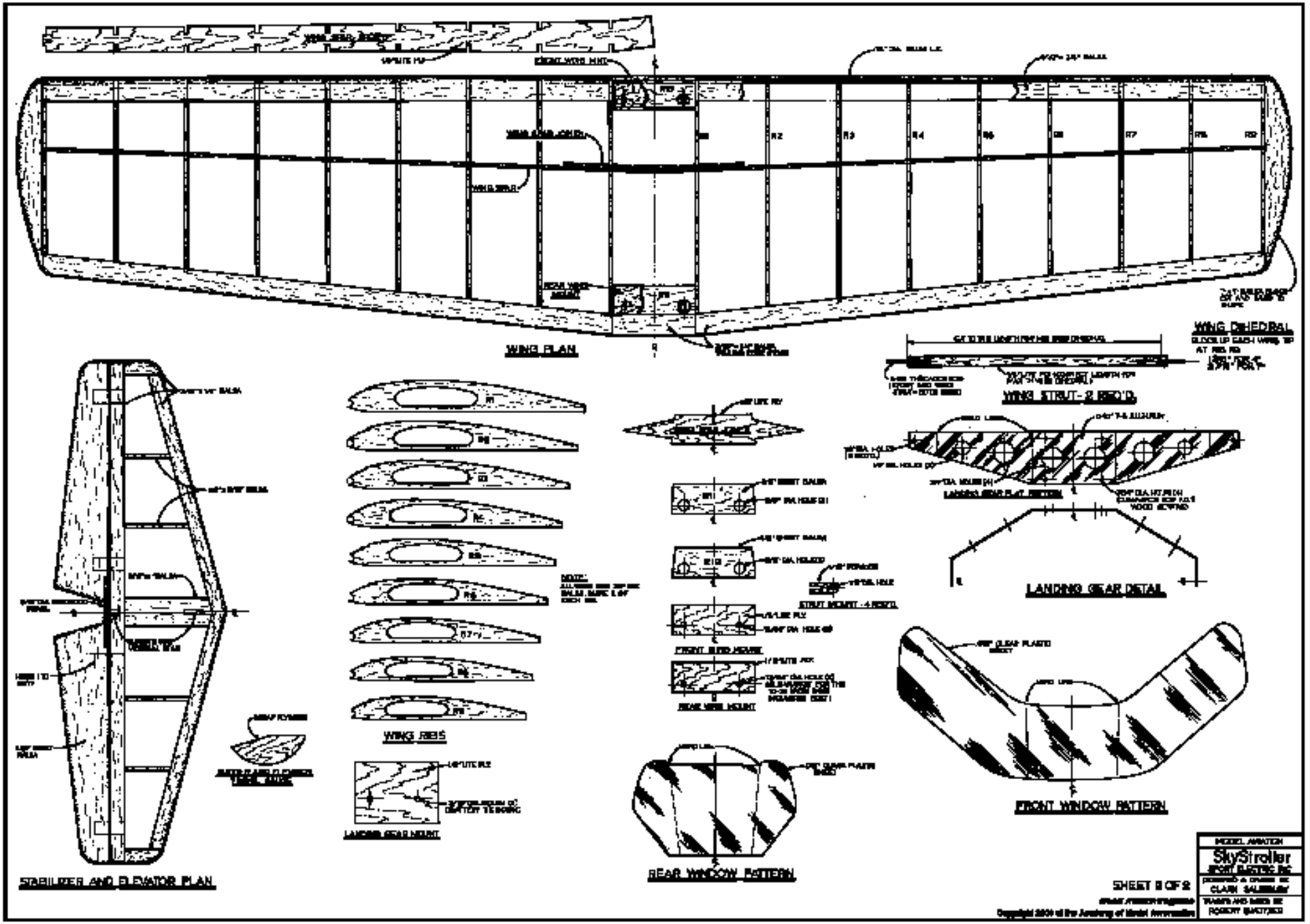
The adjustable struts can be mounted now. Make sure they do not pull the wing down or push it up.

Mount the motor, speed controller, and receiver. The battery needs to be mounted fore or aft in the bottom of the fuselage to make the CG correct, as shown on the drawing.

Type: Outdoor small-field flyer
Wingspan: 44 inches
Wing area: 363 square inches
Weight: 25 ounces
Wing loading: 9.8 ounces/square foot
Length: 33.5 inches
Motor: Graupner Speed 480 (item number 6501), geared 3.45:1
Propeller: 9 x 6 Slim Prop
rpm: 5,800 (at start)
Battery: Eight-cell NiMH, 9.6-volts, 1100 mAh
Radio system: Hitec three-channel with two microservos
Flight duration: More than 12 minutes at roughly half throttle
Construction: Balsa and light plywood
Covering/finish: White and Transparent Red MonoKote

See page 191 for Full-Size Plans listing




WING PLAN
WING DIHEDRAL
WING STRUT - 2 REQ'D.
LANDING GEAR DETAIL
WING RIBS
STABILIZER AND ELEVATOR PLAN
REAR WINDOW PATTERN
FRONT WINDOW PATTERN
LANDING GEAR MOUNT
SkyStroller
SHEET 2 OF 2

You will need two 2.5mm x 10mm screws and washers to mount the motor/gearbox. Mount the landing gear to the fuselage using #8 wood screws.

After cutting the window pattern and bending it, mount the windows with #2 x 3/8-inch-long wood screws. The drawing shows backup plywood pieces (1/4 inch square) to mount the windows. These should be glued in first so the screws can attach to them.

Flying: I took my SkyStroller to the local flying field for its maiden flight. I had my good friend Dave Stuart fly it for the first time.

I hand-launched the model into a slight breeze, and it took off at roughly a 20° climb. Dave slowed it with the speed control when it reached a couple hundred feet, and it descended so I could take photos. I took pictures for roughly five minutes, and then Dave let me fly. I was pleased with the responsiveness.

The SkyStroller flies great at approximately half speed, but it doesn't quite loop at half speed. Loops are simple to do at full speed. The airplane is easy to see in the sky; it is quite a sight with its transparent covering. Dave did try to stall the model, but it would only mush down, with no tip-stalling tendency.

Landing was routine, although the small wheels and wheel pants probably do dictate hard-surface landings. Dave's landing was on asphalt.

If you want to land in grass, I suggest using wheels that are approximately 2.5 inches in diameter, with no wheel pants. I like the looks of wheel pants, and maybe keeping them for looks is good if you want to do grass landings with the bigger wheels.

The SkyStroller is capable of a good, brisk "stroll" through the sky at 25 mph or faster. I suggest this as a second airplane for anyone who has experience flying RC. Have fun! MA

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