

Victory for AIR XX

The author scaled down a favorite model from his youth and created a new indoor event.

■ **Ken Johnson**

Years ago, when I was flying a great deal of outdoor free flight, I discovered the Korda rubber model that was kitted by Byrd Company. One of my neighbors built this model when he was about 17 years old. I was about 10 years old when my buddy Chuck and I happened onto the field, where Lupe Simon was testing his newly completed Korda.

We were awed by the performance of this large model. This experience was responsible for directing my interest to free flight in general and rubber powered free flight in particular.

Years later I decided to build and fly this same Korda record holder. At the 1969 Nationals, I wound for a third flight with a larger rubber motor after making the first two maxes. A big mistake! The model did a torque roll to the left, spiraled into the tarmac, and destroyed itself. I could have placed in Old-Timer were it not for that mistake.

I found out later that a smaller version of the Korda rubber model had been kitted. The date on the plan was 1937. It featured a 32-inch wingspan. Using just the plan I built this model, called the Victory. It was lost in a thermal several weeks after completion. Since then, three more Victories were built and lost out of sight.

Later in my modeling career while concentrating more on Indoor free flight, I remembered my experiences with the Victory. We were looking for a new Indoor event to fly at Paul Revere Gym in Santa Monica, California, so Mik Mikkelson and I conceived the AIR (Antique Indoor Rubber) XX (20-inch wingspan) event. We felt that a lot of oldtimers who came up through outdoor free flight rubber would enjoy building and flying these planes again, but as 20-inch Indoor versions.

We didn't realize that so many types of Old-Timers would emerge; we had in mind a class for Cabin and one for Stick models. Boy, were we surprised!

Bill Warner built Ed Lidgard's ornithopter and Bill Hannan entered the historic Penaud Planophore, which turned in a time of 56 seconds. Mike Mulligan built the Cloud Chaser stick model, which flew for 2:31. In all, 19 models were flown that day.

The rules were simple: 20-inch wingspan with a three-gram minimum weight without

the rubber motor. Single-surface covering was acceptable. The categories were Cabin and Stick, with a catch-all for unusual entries (ornithopters and such).

Most of our models were covered with dyed condenser paper, but covering material is optional. A three-point bonus was given for authentic colors and decorations.

It's easy to come up with a plan. Just photocopy your favorite plan down to 20 inches and use Indoor wood and sizes to make it come out to three grams or a little over. If built light and well, it will give you many hours of indoor flying fun.

CONSTRUCTION

Fuselage: Select a nice light sheet of $1/20$ C-grain balsa. Strip it to produce about 20 pieces $1/20$ square. Using the X pin technique (crossing the pins to hold each piece in place), put down the fuselage sides, one over the other. Never pin through wood this thin.

When the glue on the sides has dried, use half of a double-edged razor blade to carefully cut the sides apart. Now insert the crossmembers, using only enough cement to do the job. Make sure the structure is square and true.

Sheet the nose of the Victory with .015 balsa. The uprights for the rear motor peg are $1/20 \times 1/8$ balsa. The rear motor peg is $1/32$ round bamboo. The landing gear struts are also bamboo. I find that this wood is ideal for many Indoor model uses.

Sand or scrape the bamboo to $1/32$ round and taper to $1/64$ round at the other end. Use .010 music wire for the axle. Bend and cement as shown on the plan.

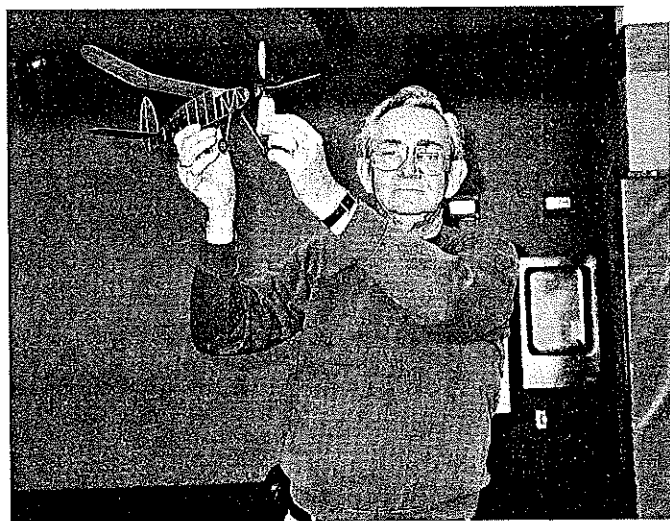
The wheels are made from two pieces of crossgrained $1/32$ sheet balsa. Sand thinner and laminate. Drill a $1/16$ hole in the center of the wheel. Sand a three-inch length of $1/16$

balsa to a round section. Insert this onto the center hole in the wheel and cement. When dry, trim the $1/16$ round hub to $1/16$ from where it cements to the wheel on each side. Insert the .010 axle through the center of the hub. A small dot of cement will keep the wheel from sliding off the axle. repeat for the other wheel.

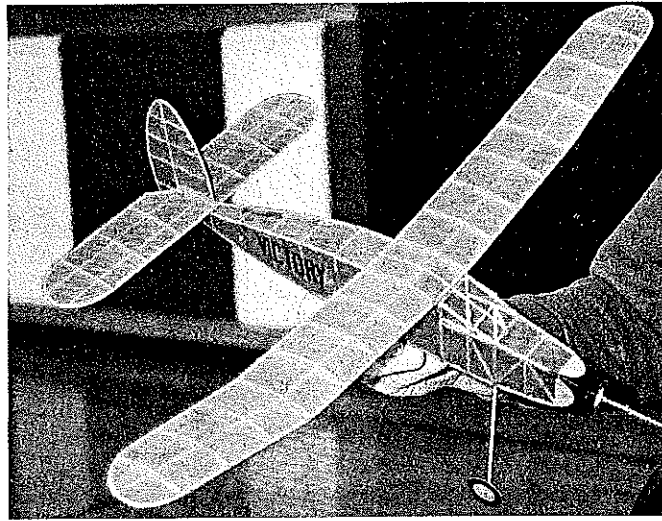
Wing: The leading and trailing edges are $1/20 \times 1/20$ balsa. The wing ribs are cut from $1/32$ light balsa. Make the rib template from .015 aluminum sheet. Lay the template over the $1/32$ balsa and cut the ribs to $1/32$ square. Make a cut along the template, then slide the aluminum down $1/32$ and make another cut, and so on. The bottom part of the rib is made from $1/32$ square balsa. After pinning down the leading and trailing edges, cement the bottom part of each rib in position. Then cut the .015 sheet balsa spar to size and cement this to the bottom ribs. Starting at the front, cement the front of the top ribs to the leading edge of the wing and the top of the spar. When dry, cut the rear of each rib to the proper length and cement to the trailing edge.

Note that the outer portion of the spar tapers at the wingtip. To make the wing tip outlines it is first necessary to cut a $1/32$ card stock template to the correct shape. Place a piece of card stock under the plan and make pinholes through the plan and into the card stock. Cut along this dotted outline with scissors and sand the template smooth. Wet a length of $1/32$ square balsa and tape it around the template, using a small piece of tape at each end. Bake in a 300° oven for 20 minutes and carefully remove the wood outline from the template.

Cement the wood outline into position on the wingtip and cut and cement the tip ribs



The author is ready to launch the little Victory. Flies very slowly if built to the three-gram AIR XX minimum weight.



Noseblock has been removed to show the rubber motor. Covering is dyed condenser paper ironed smooth and attached with dope.

and spar into position. Use diagonal cuts on the tip outlines to get a longer glue joint.

The center section of the wing is flat on the top of the fuselage. Cement in $\frac{1}{2}$ inch dihedral at the center of each side of the wing, then add $\frac{3}{4}$ inch dihedral at each wingtip. Add $\frac{1}{32}$ gussets at the breaks and the wing is ready to cover.

Stab and Rudder: Make the templates for the stabilizer and vertical fin in the same fashion as the wingtip template. The fine outline is two laminations of $\frac{1}{32} \times \frac{1}{20}$. Laminate the wood while wet with thinned white glue, tape onto the template, and bake. Remove from the template, pin to the plan, and add the $\frac{1}{32} \times \frac{1}{20}$ crosspieces to the fin.

The stabilizer paper is taped at the corners to a sheet of artist's illustration board. The coloring material is Dr. P.H. Martin's water color dye. Shop for this product at an artist's material store. Thin the liquid about $\frac{1}{3}$ with water and spray onto the condenser paper using an airbrush. Starting at the top left, spray across to the right, drop down, and repeat.

Allow to dry thoroughly, remove from the illustration board, and carefully iron (warm setting). Attach the covering with thinned model aircraft dope and mist lightly with water. This will tighten the covering so that it's just snug; any tighter and it will warp the framework.

Fashion the nose block from soft balsa. Drill an .030 hole through the block to accommodate the prop shaft. Make two $\frac{1}{8} \times \frac{3}{8}$ aluminum sheet pieces from .015 stock. Drill an .030 hole in the center of each piece.

Bend the ends in at a 90 degree angle and place these bearing plates over the front and rear holes in the nose block. Imbed the ends into the block and cement in position.

Bend the prop shaft from .035 music wire. Using small wire-bending pliers to fashion a complete circle at one end of the shaft. Center the circle hook on the shaft. The shaft should be about $1\frac{1}{4}$ inches long at this point. Pass the shaft through the nose block with the round hook at the rear. A small glass bead from your local beading craft store is slid over the shaft at the front of the nose block. A small Teflon washer is positioned just ahead of it.

Propeller: The blades are cut from $\frac{1}{32}$ medium-hard balsa. Pinhole through the plan to get a true outline shape for the blades. Soak them in hot water and tape to three-inch-diameter can at 15° off the vertical. Bake in a 300° oven for about 20 minutes.

The prop hub is $\frac{1}{8}$ hard balsa. It measures $1\frac{1}{4} \times \frac{1}{8} \times \frac{1}{8}$. Measure in $\frac{3}{8}$ from each end and cut a 45° notch from the prop hub. See the plan for the direction of the angles.

Draw a thin ink line lengthwise along the back of each blade. This line should be $\frac{1}{4}$ inch in from the back of the blade. Cement each blade onto the hub by positioning the leading edge side along the line drawn on the back of each prop blade. Check the alignment visually for straightness.

Cut a $\frac{1}{8} \times \frac{1}{2}$ piece of .015 aluminum sheet and drill an .035 hole in the center. Bend the ends up 90° and cement across the center of the prop hub. It should be across the back and up the sides of the hub.

Drill an .035 hole through the center of the shaft and the aluminum rear facing plate. Pass the prop shaft through this hole and bend two 90° bends in the end of the shaft. Cement the shaft to the propeller hub and check for tracking alignment.

Paint the prop orange and black. The

front of the fuselage is also done in black, per the plan. The wheel centers are orange and the tires are black.

Assemble the wing and tail parts onto the fuselage. Don't forget to cement a $\frac{1}{32}$ block under the leading edge of the wing. Flying the Victory: I prefer to fly this type of model to the right. Warp in $\frac{1}{8}$ right rudder and $\frac{1}{8}$ washin at the right wingtip. If necessary, add a small amount of right thrust by cementing a $\frac{1}{32}$ balsa strip behind the nose block.

Make up a 14-inch x .040 rubber motor. Insert it into the fuselage and wind to 600 turns. Check to see if the model is climbing and turning. If the Victory seems to be underpowered, it may be necessary to go up in rubber cross-section by .005.

Do not attempt to fly this plane outdoors. If built to the size and weight shown, it will be too fragile for even the calmest air outdoors. Good luck and happy flying with your little Indoor Victory.

AIR XX Victory

Type: FF Antique Indoor Rubber

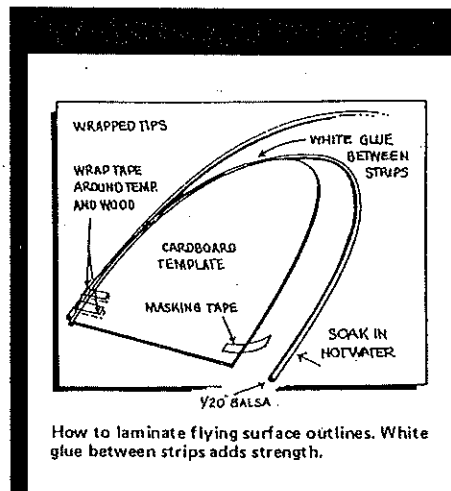
Wingspan: 20 inches (maximum)

Motor: One loop .040 x 14 rubber

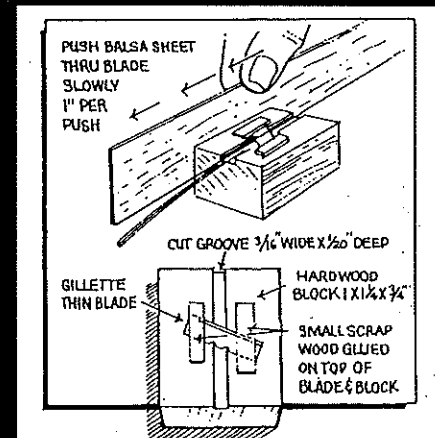
Flying weight: Three grams (minimum)

Construction: Built-up

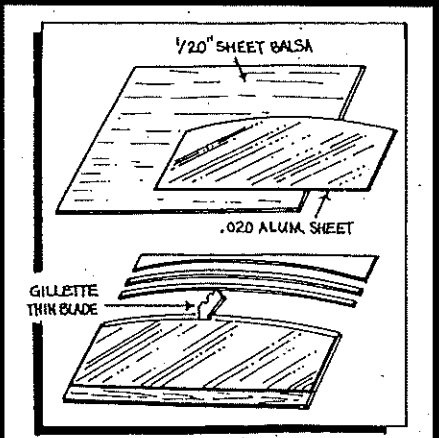
Covering/finish: Dyed condenser paper



How to laminate flying surface outlines. White glue between strips adds strength.



How to make a wood stripper; saves money and saves weight on your models.



How to slice ribs. An aluminum template and sharp razor blade are all you need.

