

CONSTRUCTION

BY RICH URAVITCH

CESSNA 310B SONGBIRD

From out of the clear blue of the western sky ... comes Sky King!

OK NOW, WITH A SHOW of hands, how many of you remember the adventures of Sky King? Legendary flying rancher Schuyler King who, along with his niece Penny, fought crime, solved mysteries and, generally, did wonderful things to rid the country of bad guys, desperadoes and, well, crooks! True fans will remember that the aerial vehicles he used for all this crime-fighting were Cessna products, first the UC-70 Bobcat and finally the C310B, both of which he named "Songbird." The episodes always opened with the sound and visual of a twin approaching and flying overhead with the announcer's voice proclaiming, "From out of the clear blue of the Western sky comes ... Sky King!" Certainly got my attention as a kid! I couldn't wait for each Saturday morning to fly with Sky!

I've always had a liking for the 310, so when I ran across a Walter Jeffries 3-view in my files, I decided to see how well-suited it would be for an RC model. It turned out to

be better than I expected. Electric power was a natural and, after some preliminary sizing, I prepared a set of working drawings. The build, even for a prototype, went very well, was straightforward and will be easily accomplished by anyone who has some basic "building from wood" experience.

The biggest issue of this project is accepting the fact that this is *not* an ARF and you'll have to build it yourself, learning traditional and valuable techniques along the way. Hopefully, you'll enjoy the activity, find it immensely rewarding and tackle other scratch-building projects. The availability of some really great electric motors and power sources makes electric, multi-engine models of this type very practical with amazing performance potential.

While space limitations prevent a complete step-by-step construction sequence on these pages, additional, comprehensive information may be found by visiting modairplanenews.com.

On the ramp at the Flying Crown Ranch, Songbird awaits the arrival of Sky and Penny for another adventure!



PREPARATION

The first step in construction is to fabricate your own "kit" by cutting out all the parts presented on the Parts Template Sheet. These are all laid out on readily available wood sizes to minimize wasted material. For those of you who consider yourselves "parts-cutting challenged," Hobby Hangar (hobbyhangar.com) offers a complete laser-cut parts package. To these parts, all you'll need to add is a small amount of strip and sheet wood. I offer a plastic parts package that includes a pair of cowls and tip tanks, a nose cap and a transparent canopy/cabin section. Visit richuravitch.com for prices.

WING PANELS

The wing is built two halves directly over the full-size plan. Prepare the trailing edge by joining the two pieces of $\frac{3}{8}$ x $1\frac{1}{2}$ -inch-shaped stock with the TEJ part. Pin this assembly in place over the plan, and add the lower capstrips, leading edge and center sheeting. Position the lower $\frac{3}{16}$ -inch-square spruce spar by using the root and tip ribs to establish the correct spar position



A low fly-by makes it all worthwhile! Although the plan doesn't show the installation, many of the small retract systems now available may be fitted to the little Cessna.

**THIS TWIN
ELECTRIC IS A
STRAIGHTFORWARD
BUILD AND A
STABLE FLYER**



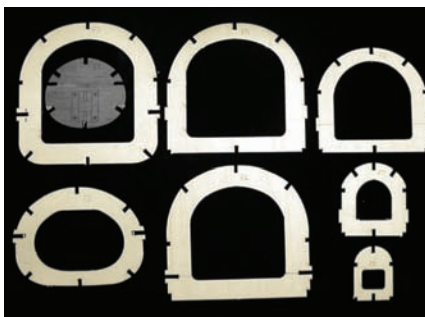
SPECIFICATIONS

MODEL: Cessna 310
DESIGNER: Rich Uravitch
TYPE: compact, sport-scale twin electric
WINGSPAN: 52.82 in.
LENGTH: 31.75 in.
WING AREA: 352 sq. in.
WEIGHT: 52 oz. (3.25 lb.)
WING LOADING: 21 oz./sq. ft.
POWER: Hacker A20 (hackerbrushless.com), BP Hobbies 2217-9 (bphobbies.com) or equiv., ThunderPower 3S 2100mAh LiPo battery (thunderpowerrc.com), 2 GWS 35A ESCs (gwsus.com), 2 APC 9x7.5 props (apcprop.com)
RADIO REQ'D: 4-channel
CURRENT DRAW: 22amps at max power
WATTS GENERATED: 245 (total)
RPM: 6550

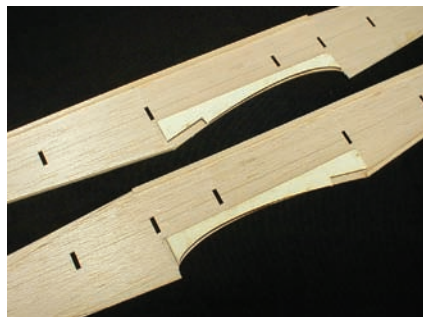
and glue the spar in place on the $\frac{1}{16}$ balsa leading-edge sheeting. Now glue all the remaining ribs in position on the spar, sheeting and capstrips. Add the hardwood landing gear blocks, lite-ply gussets, ply bellcrank mounts and center section scrap filler for the wing hold-down bolts. Next, add the upper $\frac{3}{16}$ -inch-square spruce spar, gluing securely to the ribs. With the panel assembly still pinned to the building surface, carefully position the root rib, using the dihedral gauge to establish the correct

dihedral angle before gluing. Build the opposite panel in the same fashion.

Cut a $\frac{1}{8}$ -inch-wide slot through the ribs at the spar location and dry-fit joiner WJ in the position shown on the plan. When satisfied with the fit, use ZAP (pacer technology.com) 30-minute epoxy to join the panels. With one panel pinned to the building surface, block the opposite tip to obtain the 5-degree dihedral angle established by the WJ joiner. While the epoxy is curing, make up the dowel receptacles as



The fuselage bulkheads are cut from $\frac{1}{8}$ in. lite-ply except for F1 which is birch ply because it is the mount point for the nose gear. Laser-cut part set is available.



The fuselage sides with the wing saddle doublers and longerons in place. Notches in sides accept tabs on bulkheads to aid in alignment.



This is the most difficult portion of the build, planking the forward fuselage to achieve that sleek, rounded look. Takes a little more time than a flat side but well worth the effort!



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Clear molded cabin section is glued to frame; the entire assembly is easily removable for battery and radio equipment access without having to remove the wing.



Removable cabin section is retained by short lengths of dowel at the aft end and a single nylon screw at the front edge. 3S 2100mAh LiPo battery will be located as far forward as possible.

shown on the plan. Remove the wing from the building surface and add the remaining 1/16-inch sheeting, capstrips, sub-leading edge and joiner LEJ. Glue the WCD/WCE dowel receptacle assemblies in place. Add the balsa leading edge and carve to shape, blending the sheeting to the leading edge. Add the wingtip tanks, which you'll need to carve to shape from soft balsa blocks. (Alternatively, vacuum-formed wingtips

are available as part of a plastic part set that also includes cabin, a pair of cowls and a nose cap.)

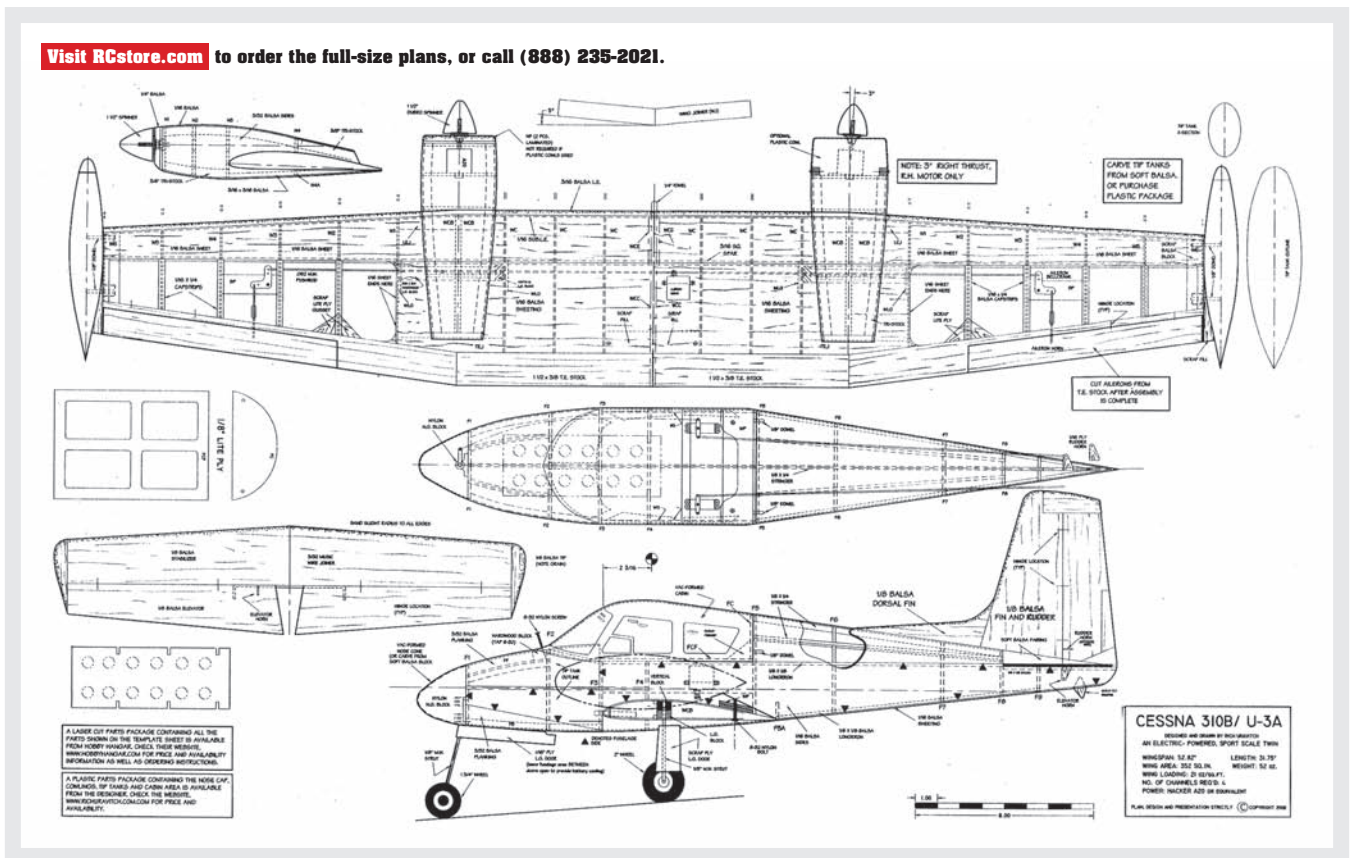
Now is the time to install the control linkages; cut the ailerons from the trailing-edge stock and temporarily install hinges. If you choose to duplicate the bellcrank arrangement shown, it works quite well if all the slop in the linkage is removed. You may wish to use individual mini servos for

each servo, coupling them via a Y-harness to the aileron channel of your receiver.

TAIL GROUP & FUSELAGE

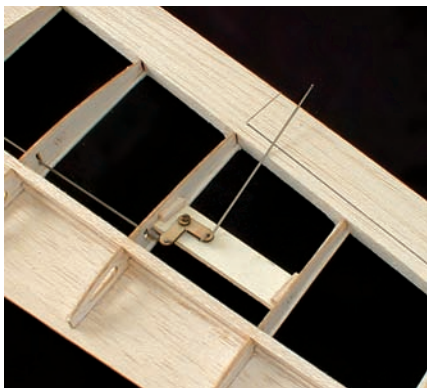
All components are solid 1/8-inch balsa sheet with the edges sanded to a slight radius for appearance. After assembly, sand to shape, make up the wire elevator joiner and temporarily hinge the moving surfaces.

The fuselage of the 310 is easy to build as

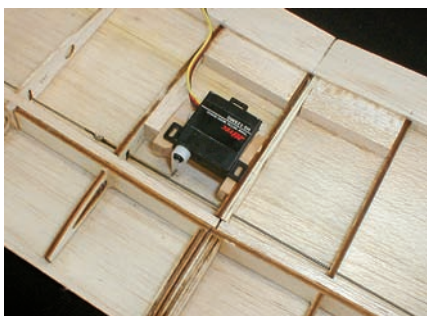


it is basically flat-sided. The rear upper section is a rolled flat panel section, which can be applied in two pieces rather than requiring strip planking. The only compound curve is the area forward of the windshield, top and bottom. I used soft 3/32 balsa to plank these areas to provide extra material for final sanding and blending to the fuselage sides. Start assembly by preparing a left and right fuselage side by adding the WS (wing saddle) doubler, balsa tri-stock and longerons. Selecting similar grain/hardness balsa for the sides will help ensure a twist-free fuselage. Add all the bulkheads, making sure to keep things square. Adding the stringers, sheeting and detail parts will move construction to the nose section, which is strip-planked.

The nacelles are assembled just like the fuselage, but because they're flat, they're easier to build. They may be all wood or you can choose the formed cowl option. In either case, making the cowl removable back to the firewall makes motor installation much easier. After final shaping and sanding, the nacelles will be permanently attached to the wing.



Aileron drive system uses .062 music wire through 90 degree bellcranks but two micro servos, one per aileron, may also be used. Keep linkages tight and slop-free!

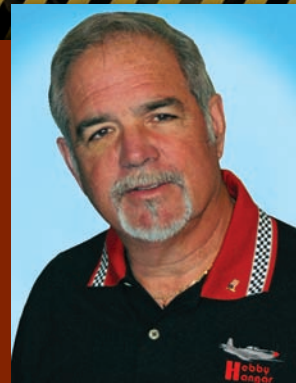


Aileron servo is located in center section of wing, offset to one side of center rib. Wire linkages go through 90 degree bellcranks to aileron horn.

ABOUT THE AUTHOR

RICH URAVITCH: DID YOU KNOW?

A former USAF "Sierra Hotel" pilot, Rich worked at Fairchild Republic and joined the A-10 team as Aircraft #30 rolled off the line. He also was logistics program manager on the T-46 program. We caught up with Rich for a little model talk. Here's what he said.



Can you tell us how you got started and with what type of planes you built back then?

RU: I got started in the hobby building Strombecker solid display models. I have fond memories of a Globe Swift. No vacuum-formed or injection molded parts back then; these came later with the Monogram Speedee-Bilt and Superkits, which I lusted after and spent lunchless school days to fund the kit acquisition.

What was your first RC model?

RU: It was a Babcock Breezy Jr. with a Babcock Magic Carpet receiver, Magic Wand transmitter and compound escapement. A Wasp .049 gave way to an O.K. Cub .074, which took the Breezy to its final resting place, one of those undisclosed locations somewhere that have now become shopping malls.

Why did you decide on the Cessna 310B from Sky King for your latest project?

RU: I guess I've always liked the airplane. To me, the straight tail "A" and "B" models were the best-looking of the series. My model was originally going to be finished in a U.S.A.F. U-3A "Blue Canoe" scheme until I remembered the adventures of Sky King, did a little web research and found lots of interesting information. The "Songbird" colors were attractive, the airplane had widespread recognition through the popular TV serial of the day and it would translate well to model form. That, a little motivation and a set of Jeffries three-view drawings was all it took!

What impresses you the most about our hobby today?

RU: I really am amazed at the quality and sophistication of the models I see today. The present day ARF models that would have been very competitive in the Sport Scale class of 20 years ago and now, scale competition models that are flown routinely, are true museum pieces. I can remember "hangar flying" about the possibility of turbine-powered jet models and today, they're everywhere. The molded-foam EDF models are amazing, too. They're very scale looking, inexpensive and fan/battery technology has made them not only viable, but also practical for trouble-free, everyday sport flying!?!?

FINAL ASSEMBLY

Fit the 1/4-inch dowels to the WCD/WCE assemblies, center the wing in the fuselage and drill holes in F3 to accept the dowel. With the wing centered, drill through the trailing edge into the WP parts and tap the holes to accept 10-32 nylon bolts. With the wing bolted in its final position, glue belly formers on the lower wing center section, followed by the 1/4 x 1/4-inch center stringer and add the lower 3/32-inch balsa sheeting, blending it with the lower fuselage sheeting. Fit the entire tail group to the fuselage, making certain everything is square by measuring from wingtips to stabilizer hinge line. When installing the vertical fin, make

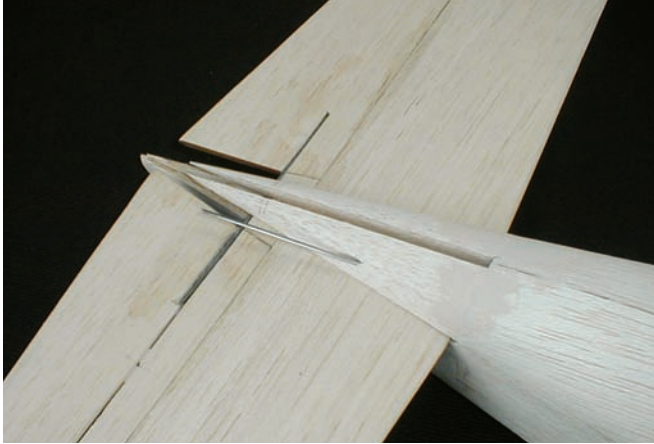
certain it is properly aligned and perpendicular to the horizontal stabilizer. Short lengths of dowel may be used to strengthen the fin/stabilizer/fuselage joint. Add the soft balsa fairing blocks, carve and sand to shape.

HARDWARE

Now is the time to add your favorite radio and propulsion system. Everything fits neatly under the removable cabin section, which is held in place by a pair of dowels at the aft end and a 6-32 nylon screw at the base of the windshield. This compartment houses the single LiPo battery, both ESCs and all the radio components, with the



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Soft balsa blocks are carved to shape and used to form fin to stabilizer fairings. Elevator halves interconnected with a "U"-shaped music wire.



All framed up awaiting final sanding and covering. Cabin section has not yet been removed to accept final configuration clear parts. Note molded cowls, tip tanks and nose cap available from hobbyhangar.com.

exception of the aileron servo.

After installing the motors of your choice, fit the cowls. Whether you choose to build the cowls from wood or use the available formed plastic parts, simply attach them with three screws into hardwood blocks on the firewall.

COVERING

Although the specific model presented here represents Sky King's Songbird, there are a great number of other attractive color schemes available, including the U-3 Blue Canoe used by the Air Force in the late 1950s and 1960s, foreign air forces, plus a great selection of civil, general aviation schemes. A search of the web will yield a goldmine of terrific ideas, both civilian and warbird. I used UltraCote white and yellow

for the basic colors with the brown trim coming right out of a Testors spray can. Make sure you mask off the clear window areas before spraying the cabin part! Whatever your choice of schemes, make certain you prepare the airframe for covering by carefully sanding and filling any imperfections prior to application of the final finish; flaws will always show through!

FLYING

With the CG at the position indicated, the little Cessna is about as stable a twin as you could hope for. It has no real quirks; stalls are non-events with the nose just settling gradually, and it slows down just great on landing. Aileron rolls tend to be non-axial, as you would expect for the type, especially with all that dihedral. Loops are big

and open and inverted flight, despite the airfoil and force arrangement, requires surprisingly little down elevator to maintain. The landing gear position and spacing make ground handling a pleasure, with excellent tracking during takeoff and landing roll out, neither of which seems to exceed 20 feet!

After a lot of flying time on the prototype, I find that the model has no vices and can be easily managed by fliers with some experience with low wing, aileron-equipped models. The 310B is a fun airplane to both build and fly, and it gives you an opportunity to add an attractive, small twin to your hangar; hope you enjoy it! Your comments and suggestions are invited and appreciated, contact me at man@airage.com. ✚

Landings are very gentle, sink rate very predictable and easily managed with power. No need for flaps and no tendency to tip stall when slowed down! Confidence building electric twin!

**THE MODEL CAN BE EASILY
MANAGED BY FLIERS WITH SOME
EXPERIENCE WITH LOW WING,
AILERON-EQUIPPED MODELS**

