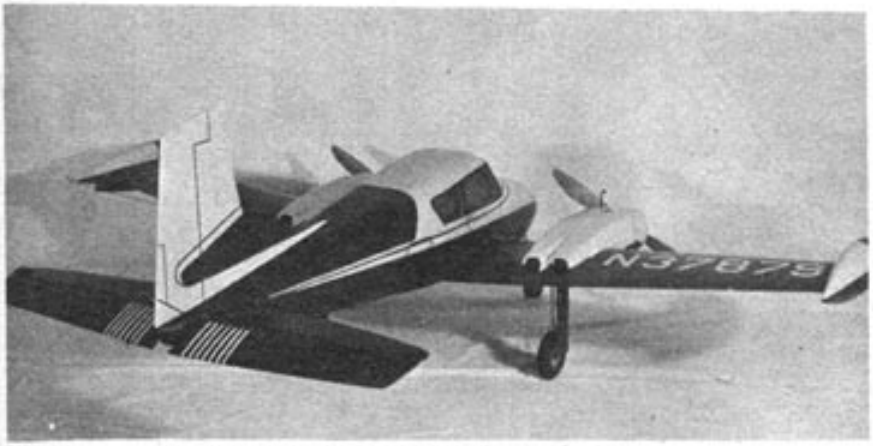
Heads of the twin Webras stick out from the "flat" cowls. For that eye-popping color scheme, sand and sand and do exactly what the man sez.



With the exception of lead-outs, needle valves, and other modeling tell-tale details, the only departure from scale is the half inch addition to the gear for prop clearance. Below—pretty, any view.

Cessna 310

By HARRY A. WILLIAMSON

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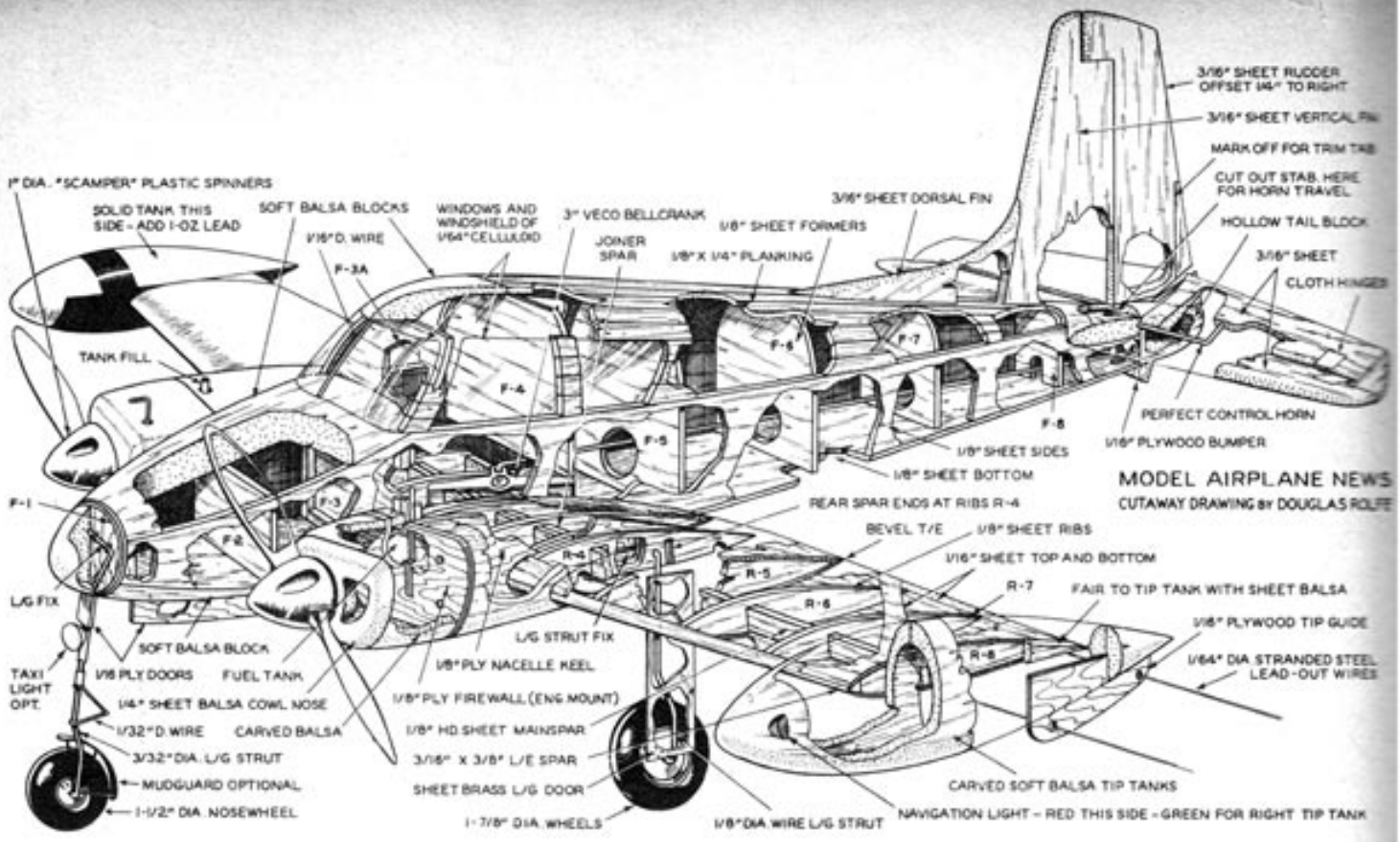
This twin-engined scale job is nice airplane, as pilots would say. No involved fancy stuff, but real looking. On .15 engines, good power reserve.

OUTSTANDING performance and appearance distinguish the Cessna 310 as a "hot" competitor in the currently booming light-twin, executive plane market. This latest addition to Cessna's line of business and private aircraft is just about the "schmaltziest" ship flying today.

Powered by two, 6-cylinder, Continental engines, rated at 240 h.p. each, the "310" cruises at 190 mph plus on only 60% power with a full gross load of 4,600 pounds. Top speed is in excess



of 220 mph! The excellent single-engine performance of this ship endears it to the hearts of the pilots and gives it that nice, comfortable margin of safety so desirable in executive transports.

The luxuriously appointed cabin, with its foam-rubber seats, provides ample room for a total of five people. The sharp, downward slope of the nose provides excellent visability when taxiing and in flight. Truly, this is an outstandingly modern airplane and it's all yours for only $49,950.00!

When we first saw a picture of the "310" some time back, it was love at first sight. Since we were smitten and couldn't afford to buy the real thing, the next best thing was to whip up a model version. The results are presented to you on these pages.

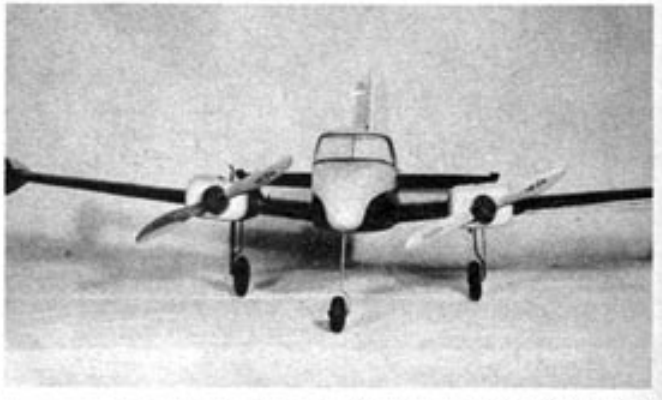
We wrote to the Cessna factory in Wichita, requesting a set of scale drawings and some performance poop, and their generosity helped us draw up a ship that is as true to scale as possible. The only deviation from true scale is the addition of ⅛" to the gear length, to provide adequate prop clearance.

This model is built to a scale of 1" equals 1', giving it a 36" wing-span. At first glance this may seem a bit on the small side for the two .15 cu. in. engines but scale models have a strong tendency to come out on the heavy side, and the extra power is then needed to insure good performance.

Construction of the "310" is not at all difficult, but should be tackled only after the drawings and text are completely understood. The materials used are all commonly available in most hobby shops. The design of the model is "standard" throughout—nothing unusual or tricky. The nacelle design may seem a little out of the ordinary by virtue of the plywood keels, but this feature was incorporated to provide a strong, vibration-free engine mount, in addition to providing a point for secure gear attachment.

The actual building of the model should begin with the wing, since it must be completed before mating it with the fuselage. After cutting out the required number of parts, begin assembly, making up the main spar into a unit. Then, add the ribs to the main and rear spars, working from the center section out to each tip. During this operation, the spars should be (*Continued on page 46*)

Those clean lines hide some mighty sharp structural design, as is apparent from Doug Rolfe's cutaway drawing at the top of the page.



Large prop disc area in relation to 36-inch span means that a goof on weight won't put you out of business. Ship stays out on lines.

Cessna 310

(*Continued from page 10*)

pinned down to a flat, working surface. Sufficient care and patience to achieve proper fit and alignment here will guarantee a strong, warp-free basic structure. It may be advisable to note here that the airfoil section used on the model is fairly close, but not exact scale. We took the liberty of flattening the undersurface between the spars, to enable the wing to be built on the bench without excessive blocking-up.

The engine nacelle keels must be accurately cut from ⅛" plywood, and snugly fitted to both spars at the positions indicated. Before cementing them permanently in place, check carefully with a small triangle to insure their perpendicularity with the top of the main spar. The leading edge may now be butted against the nose of the ribs and carved and sanded to the cross section shown at each rib station. *Do not shape the leading edge for the length of the center section*—the basic rectangular shape provides more glue area for the joint between it and the fuselage for greater strength.

The entire control assembly—bellcrank, bellcrank mounting block and lead-out wires must be installed before sheet covering, and should be checked for smooth operating characteristics. The landing gear struts are formed of ⅛" music wire (make one right and one left) and J-bolted to the nacelle keel and main spar. The free end of each strut is lead through a hole provided in the rear spar. It will probably be necessary to cut away a small portion of each wing rib on the inboard side of the nacelle keels, to insure a firm mounting for each strut.

Medium soft, slash cut (check for flexibility parallel with the 36" length) sheet balsa, 1/16" thick is used to cover the wing. Each panel is covered separately from the nacelle keel inboard to the junction of the center section and outboard to the tip ribs. The covering must be firmly cemented to each rib and to the leading edge. Make a careful check throughout this procedure, to insure that no warps occur that may bring about some disastrous "didoe" on the first flight. The center section (as indicated on the drawings) should be left uncovered. Sand the entire wing to the final outline, and shape with 40 paper.

Cut the firewalls from a good grade of plywood and cement them to the nacelle keels. Notice how the keels and firewalls are keyed together—this should be done precisely or the joint will be weak and useless. Weldwood glue is strong and hot fuelproof and is recommended at this point.

Trace the nacelle outlines on soft balsa blocks and saw them to shape. Spot-glue the blocks to the nacelle keels and wing covering and carve to shape. This same operation should be repeated for the cowls.

After rough carving and sanding, the cowls and nacelles are removed and hollowed to the outline shown on the plans. Methods for cowl mounting are determined to a great extent upon the engines used and may be best left to the discretion of the individual.

Unless your hobby shop has something most of them don't, it will probably be necessary to get tanks of about 1 oz. capacity that would fit the nacelles and still be in a position to function. Note that the tanks are similar in size and shape, differing only in outlet tube design. The tanks should be secured to the nacelle keels with small wood screws, before installing the nacelle blocks permanently.

Although it is not mandatory, we would like to suggest that the engines be radially mounted for strength and simplicity. Brass "tee nuts" or similar fastenings should be permanently affixed to the rear of the firewalls (before installing the nacelles). Completion of the wing structure to this point will make it practical to begin work on the fuselage.

After cutting out all the parts required, begin the fuselage assembly by joining the two sides with the formers. The upper, rear portion of the fuselage is planked with ⅛" x ¼" x ½" wide soft balsa strips. The upper and lower nose blocks and upper cabin block should be roughly sawed to shape and cemented in place, then carved and sanded to the final outline.

Form the nosewheel strut from music wire and sew (with soft copper wire), or J-bolt, to the plywood nose former F-1. This entire assembly is then securely glued to the front of the fuselage and the small, soft balsa nose block added.

It would be advisable to join the wing and fuselage at this point. They should be very thoroughly cemented together to eliminate any possibility of an inflight "divorce." Don't forget to insert the pushrod in the bellcrank, or the controls may not function too well. The fuselage bottom sheet, and the soft balsa fairing at the leading edge of the wing center section, are now added.

The "tailfeathers" (rudder and stab) are cut out of medium-hard sheet balsa. The stab should be carefully tapered to the thicknesses shown on the plan. Join the stab and elevators with aircraft tape hinges (don't use crinoline or gauze). The control horn assembly must be thoroughly cemented to each elevator half, and the wire covered with aircraft tape or nylon, to make sure it stays put. Use plenty of cement when assembling the rudder and stab to the fuselage—working the excess around with a finger tip to form fillets. Their alignment should be carefully checked, and the rudder off-set about ¼". Hook the rear end of the pushrod thru the control horn and check the entire control system for freedom-of-movement and approximately equal motion, then cement the hollowed balsa tailcone to the fuselage, and the "dogwork" is completed.

You have now reached the second plateau—sanding! With progressively finer-grit papers, starting with no coarser than 40 and ending with 80, the entire structure must be sanded and sanded and sanded, until there ain't a lump or a bump anywhere. All cracks and/or depressions that may occur during this operation should be filled with Plastic Balsa and sanded smooth. In order to get a finish that will do a model justice, there is no substitute for sandpaper and elbow grease—so on and on until perfection! To protect the soft balsa from damage and to eliminate the fuzz, two coats of thinned, clear dope should be brushed on and lightly sanded to a stain finish.

Before proceeding any further, it would be advisable to install the windows and windshield. They should be carefully cut out of 1/64" thick clear celluloid and cemented to the fuselage. This operation should be done with care and precision. Nothing can mess-up the appearance of an otherwise beautiful model more than poorly fitted windows, or those with cement smeared all over. Before final finishing, they should be carefully masked.

The finishing stages of any model, where appearance is of major importance, should be carefully planned—well in advance of the actual operation. Primary and secondary colors (if any) should be chosen for harmony and some thought given to the final trim and striping. For instance: If red and cream (or white) is the combination selected, the exact outline each is to occupy should be determined. The sanding sealer and primer-surfacer should be light in color, because of the poor "hiding" properties of cream and white. The lighter shade of dope should always be applied first to eliminate "bleeding." Intelligent planning prevents a lot of unnecessary work!

It goes almost without saying that a sprayed finish will give the best results but if this is impossible, a good brush job with thin dope can be a credit to any model. Rather than go into a lot of tedious detail, we will list a minimal finish that will be adequate for most purposes and not add a lot of weight.

1. Four to five coats of sanding sealer, with a light sanding between coats, and wet sanding after the final coat.
2. Four to six coats of primer-surfacer, again sanding lightly between each coat and wet sanding after the final coat.
3. Eight to twelve coats of colored dope, thinned approximately 60% dope and 40% thinner. Sand lightly between each coat.
4. Striping may be best accomplished by carefully masking the outlines with narrow strips of masking tape, and pressing them firmly in place. To keep the striping dope from running under the edges of the tape, try brushing a little clear dope along the inside edges of the tape, using a fine striping brush. It only requires a few minutes but is well worth the effort.

The final appearance is best determined by the individual's requirements. If the model is to be flown in scale and beauty events, finish it as the competition requires. On the other hand, if your version is only for Sunday flying in the local schoolyard, the finishing procedure we have outlined will be more than adequate.

As a final note, before we leave the subject; to achieve that beautiful lustre the judges admire and the girls gush over (what's this?), rubbing compound is the answer! A thorough rubbing with a very fine grit compound, followed by several coats of wax, will really bring out those highlights.

Before flight, check out everything very carefully once again. Nothing looks sadder than a beautiful scale job scattered all over the cold, cold ground. The "310" should balance approximately 1" behind the leading edge at the center section. In no case should the balance point be aft of this—although it may go forward to the leading edge. Add ballast, as required, to bring the balance point in range. The original model needed nothing added (ain't we lucky?). The "310" handles well and stays out on the lines, so no trouble should be encountered if everything has been carefully done.