

Cessna L-19 "Bird Dog"

Has the Half-A flying scale "bug" gotcha? Then what better project could you try than this beauty?

■ During the fall of 1949, the Air Force and the Army worked out a set of specifications for a new and improved liaison airplane. Several leading aircraft manufacturers entered into competition to design an airplane that would fulfill these specifications; the Cessna 305 was the winner.

Deliveries of this model in quantity were made in the fall of 1950 with the Army designating it their L-19. On duty in combat areas six to ten hours every day, this flexible observer has proved itself tops for "flushing" enemy troops, hence the nickname "Bird Dog."

The *Bird Dog* is an all-metal airplane with a 36 ft. wingspan and is powered by a 213 hp engine. It has a maximum speed of 146 mph and an observation speed of only 46 mph.

The model presented herewith is scaled one inch to the foot directly from factory-supplied drawings. However, in order to improve lateral stability and all-around performance, the dihedral angle and stabilizer area have been slightly increased. Control line scale fans should follow the scale stab and

By

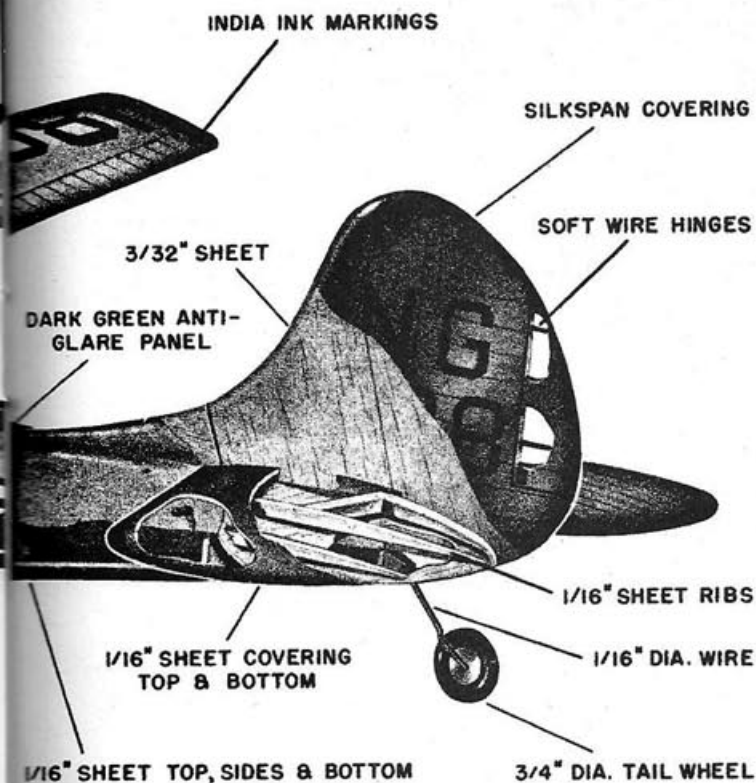
AUBREY "RED" KOCHMAN

dihedral—as per dotted lines on plan.

In keeping with the all-metal construction of the *Bird Dog*, our model is constructed primarily of 1/16" sheet balsa. Light weight being a prime requisite of any successful Half-A flying scale model has more or less dictated that the finished model be patterned after the National Guard's polished aluminum finish with dark green anti-glare panels. The olive drab paint job as used by the Army and the Marines would require considerably more applications of colored dope, and therefore add weight, to achieve the same finishing results as can be had with two or three coats of aluminum dope.

Start construction of the fuselage by cutting the sides and formers to shape. Notice that former F-3 is built up and includes the plywood landing gear mount which should be drilled for the "J" bolts before assembly is begun. Mark the former locations on the inside of both side pieces and cement the side doubler sheets to the sides between F-1 and F-3.

Assemble the sides by first cementing F-3 and F-4 in place. Add formers F-2, F-5, F-6 and F-7, working



rearward to F-7. As seen on the plan top view, the fuselage has a straight taper rearward from F-3. It is important that this straight taper be maintained or real difficulty will be encountered when adding the top and bottom sheeting.

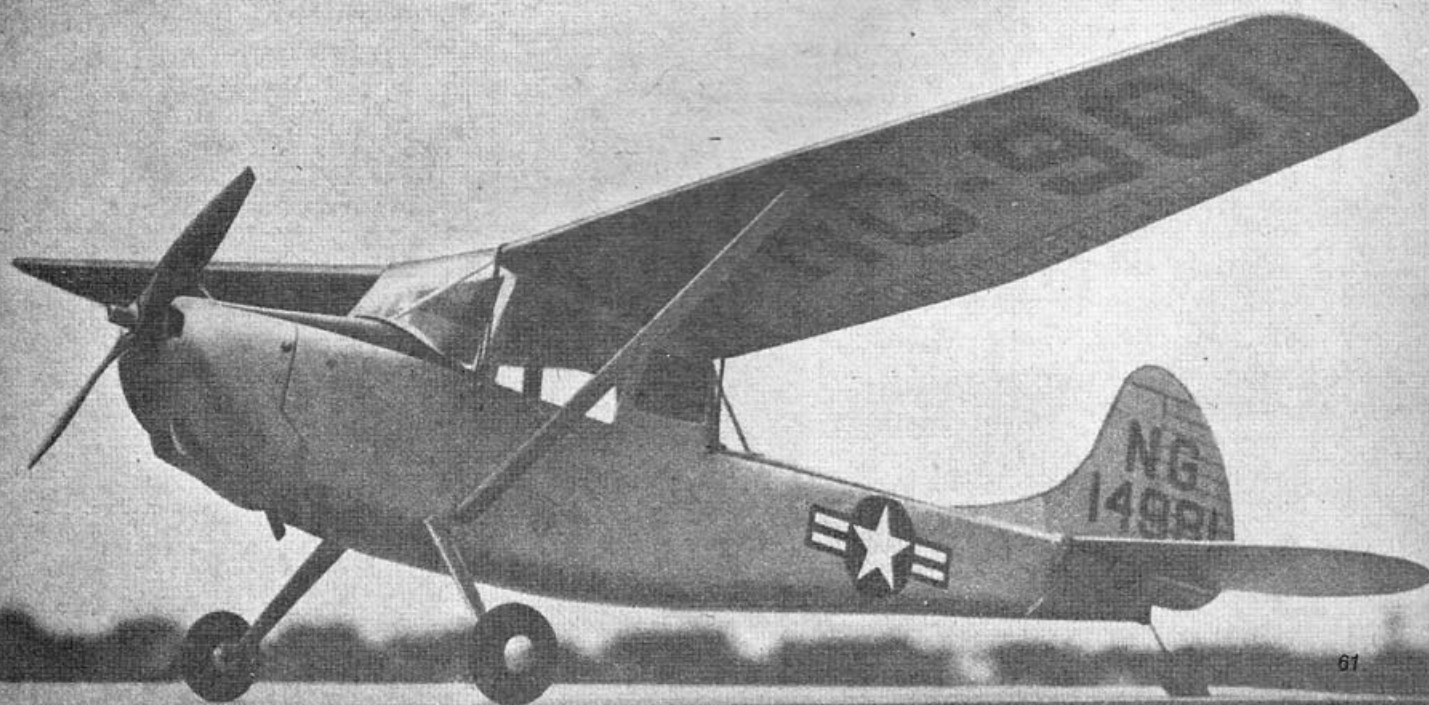
Cement the window outline pieces in place and add the $\frac{1}{8}$ " sq. pieces as shown in the front view at F-10 and also on the side view. Cut the top cabin pieces from hard $\frac{1}{8}$ " sheet and cement them in place. These

pieces also form the wing rest. Cut F-1 from $\frac{3}{32}$ " plywood and drill the engine mounting holes as shown if a "Wasp" is to be used. If a "Spitfire" timer is mounted, cut a hole in the plywood as shown. This hole will allow the fuel line tubes to extend through the face of the firewall.

Cement F-1 in place and also the $\frac{3}{32}$ " sheet from the bottom of F-1 down and rearward to F-8. This piece seals off the fuselage from engine exhaust and forms the mounting piece for the dummy exhaust stacks. Cement the timer in place and where necessary use scrap balsa wedges to hold it in its proper position. When located properly, the actuating arm and spring clip can be operated without difficulty. Cut a small hole in the opposite side of the fuselage so that a small screwdriver may be inserted through it to make necessary adjustments to the timer.

Solder the engine mounting nuts to a brass plate and cement the plate to the rear of F-1. Add the remaining formers and the tail wheel unit. Bend the landing gear to shape and bolt it in place.

Covering the top and bottom with $\frac{1}{16}$ " sheet is quite simple if the following procedure is followed. Cut the sheet to proper length. Cut an $\frac{1}{8}$ " wide strip of paper (writing paper is fine) and use it to measure the exact circumference of the first and last formers to be covered. Mark these lengths off on the corresponding ends of the sheet. Use a metal straight edge when cutting to shape. Apply a thin coat of cement to the underside of the sheet, spreading it evenly with your finger. Wet the outside of the sheet with water, being careful not to get any water on the still-wet



cement side. As the cement dries it will curl the sheet. Check the amount of curl by trial-fitting the sheet to the fuselage. When the sheet closely assumes the proper shape, cement it in place.

The bottom of the fuselage between F-4 and F-8 cannot be sheet-covered because of the double bends involved. Therefore it must be planked. Use 3/32" thick strips. Start planking at the center and work toward the sides. When completely planked, sand to conform to the sheeting thickness.

Build up the cowl and carve to shape shown. Use Weldwood glue to hold the hardwood blocks to the firewall. The cowl is thus held in place with two small wood screws that pass through the cowl and into these hardwood blocks.

Six-inch balsa sheets should be

used for the wing to simplify construction and insure a smooth airfoil. Notice that although the top surface of the wing employs a straight dihedral, the lower surface has a slight polyhedral. This is accomplished in the following manner.

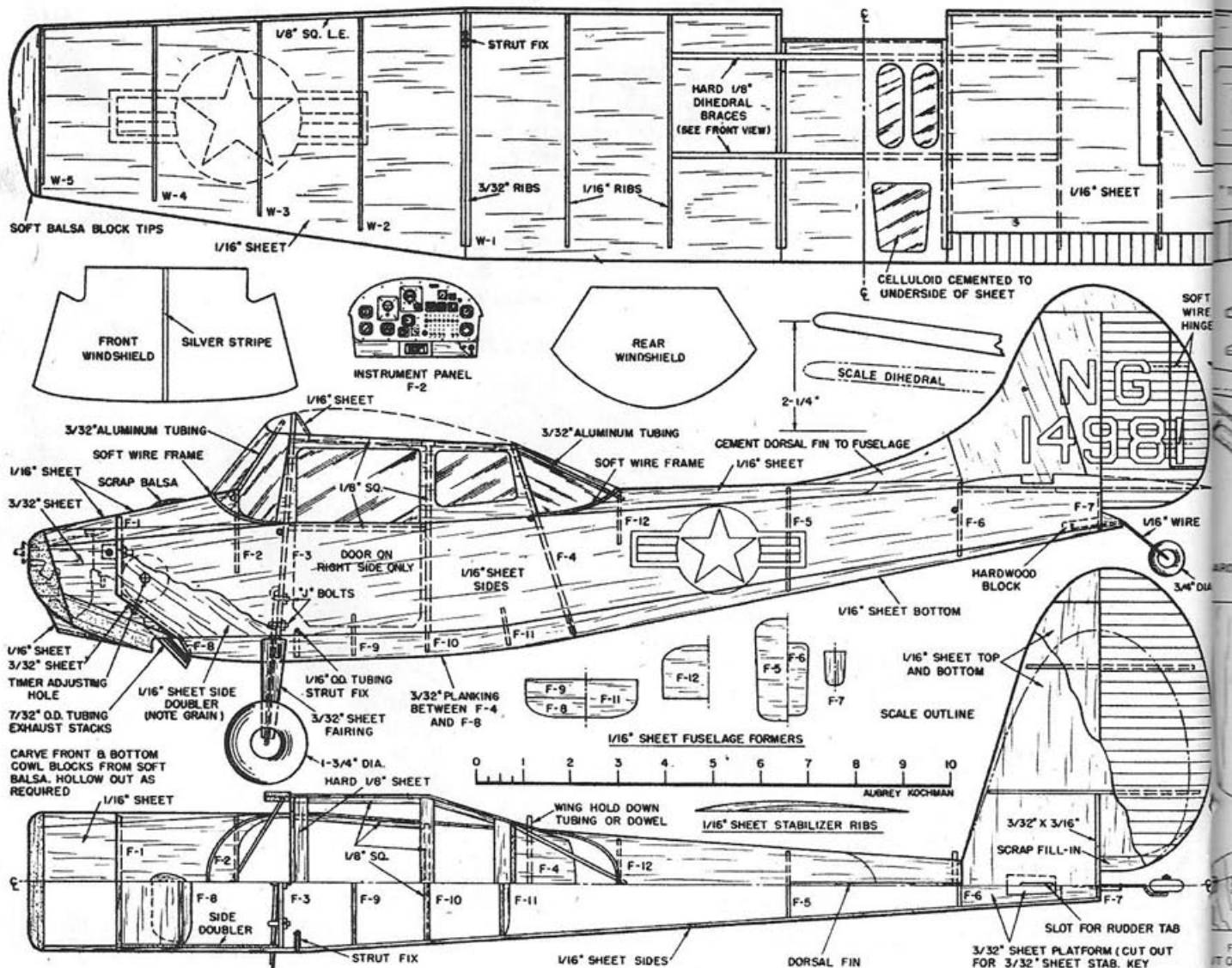
Cut the 1/16" sheet to outline shape, excluding the tips. Then cut this sheet into five panels corresponding to the dihedral breaks. Cement the 1/8" sq. leading edge in place on the sheets. Cut all ribs to shape from stock indicated and cement them in place. Cut the two dihedral braces from hard 1/8" sheet and cement them across the center section sheet.

Working on one half of the wing at a time, taper the 3/32" double ribs for proper dihedral angle and cement the panels together. The

top covering is cut to outline shape but slightly oversize, about 1/4", to allow for bending. Cut this sheet into three sections, the center section and two main panels. Use a slow-drying cement and plenty of pins to hold the top sheeting in place. Sight along the trailing edge and eliminate any warps. This is important, for once the cement has dried it is practically impossible to correct even the slightest warp.

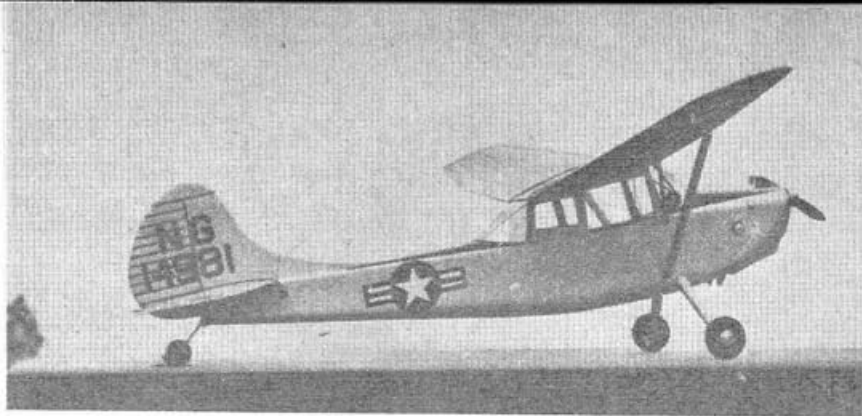
When the cement is completely dry add the balsa tips and sand the entire wing to airfoil shape. The center section sheet is now cut out as indicated for the windows and the celluloid cemented to the underside of the sheet. Paint the inside of the center section aluminum before cementing the top sheet in place.

The construction of the stabilizer



follows that of the wing. Cut the top and bottom sheets to outline shape. Cement the ribs in place on the bottom sheet. Add the short $3/32$ "x $3/16$ " spar and cement the top sheet in place. Fill in with scrap balsa as shown. Cut the rudder to shape from $3/32$ " sheet, preferably quarter grained, and cement to the stabilizer. Note that the rudder is notched into the stabilizer. The tail surfaces are removable but the dorsal fin is cemented to the fuselage.

Go over the entire model with fine sandpaper and remove any irregularities. Cover the whole model with lightweight Silkspan and apply at least three coats of clear dope before color doping. After color doping install the instrument panel. The panel was cut from a piece of silver Trim-Film



We've all seen some mighty nice-looking Half-A free flight scale jobs since the event became popular, but this one is a real honey. The National Guard color scheme of silver was chosen to keep weight low. Control line fans can load 'er up, though, with olive drab if desired.

without removing the paper backing. The instruments are all black-faced. India ink works well for drawing in the numerous dials, knobs, switches etc. The lower portion of F-2 should be painted black before cementing the instrument panel to it.

Cement the celluloid side windows in place from the inside of the fuselage. Bend the soft wire windshield frames to shape and carefully cement them in place. Add the celluloid windshields. A thin strip of silver Trim-Film goes on center of front windshield.

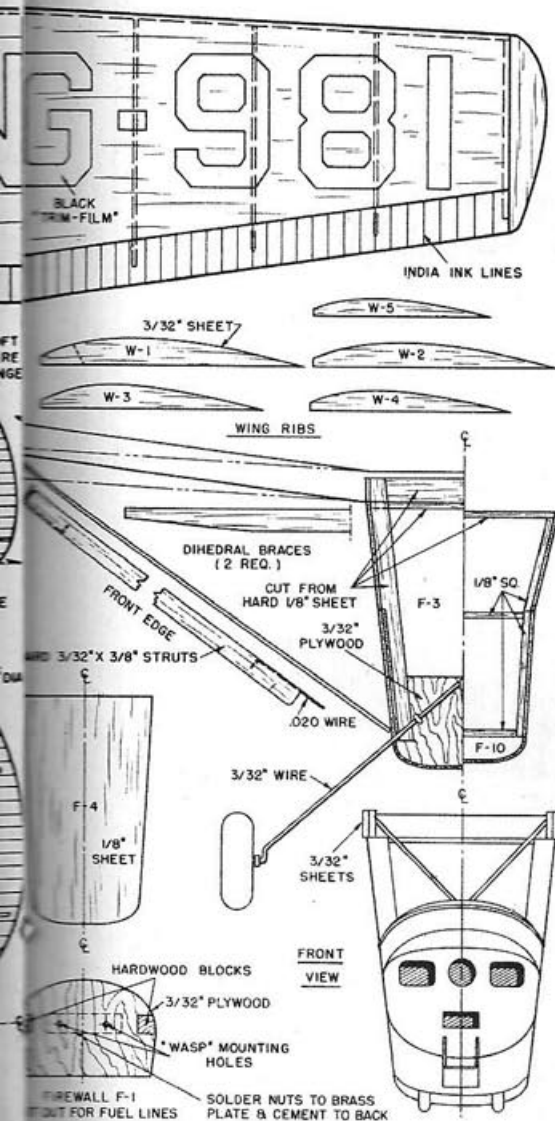
Slight modifications must be made to the Wasp fuel tank in order for it to hold fuel while in an inverted position. For obvious reasons the small breather hole must be plugged. The pointed end of a safety pin carefully driven into the hole will do the job very nicely. A new breather hold is drilled into opposite side of tank.

Cut the dummy exhaust stacks from $7/32$ " aluminum tubing. Pinch one end together and drill a small hole through this flattened end. The stacks are held in place with small wood screws and cement. By wiring the glowplug to them, the stacks become the outside starting battery connections.

Before attempting hand glides or power flights make certain that the model balances at one third the wing chord. Your *Bird Dog* has a natural tendency to fly in left-hand circles under power. So it's wise to use a low-pitch propeller for initial flights.

BILL OF MATERIALS

4 sheets of $1/16$ "x 6 "x 36 ". 2 pcs. $1/8$ " sq. x 36 ". 1 sheet $1/8$ "x 2 "x 36 " hard. 1 sheet $3/32$ "x 3 "x 36 ". $3/32$ " plywood. $3/32$ " dia. wire. $1/16$ " dia. wire. $3/32$ " dia. alum. tubing. $7/32$ " dia. aluminum tubing. 1 pr. $1 3/4$ " dia. wheels. $1 3/4$ " tailwheel. 1 sheet lightweight Silkspan, cement, clear dope, aluminum dope, dark green dope, silver and black Trim-Film, 4 Air Force insignia. Flight timer. Note: Additional materials required such as cowl blocks and wingtip blocks are not listed by size as these can be found in your scrap box.



Here is the "real" L-19 in its official Army dress: olive drab with silver numerals and lettering, official US air insignia on side of fuselage. "A-289" appears on underside of left (port) wing and topside of right wing. L-19 is rapidly replacing L-5 in the field.