

**Gruman's  
"Ag-Cat"  
Proves Perfect  
Subject For  
Control Line  
Scale Builders**

By Paul J. Palanek

Wildcat, Hellcat, Panther, Cougar, Tiger and now, the Ag-Cat crop dusting biplane by Grumman Aircraft. Like its predecessors it is a fighter—a fighter of agricultural pests.

From the ground up the Cat is designed for crop spraying or dusting. It incorporates a number of unusual features. For one thing, the plane will take half a dozen different engines in the 200 to the 450 h.p. range. The choice is left to the buyer. Upper and lower wing panels are interchangeable along with the ailerons. Rigging is simple, no internal and a minimum of external wiring.

Both the air speed indicator and engine tachometer are mounted on a separate panel forward of the cockpit in the pilot's "flying line of vision". During dusting or spraying operations pilots have little time to look inside the cockpit.

Specifications for the airplane are overall length of 24' 8"; 35' 8" span; gross weight 3600 lbs; empty weight 2180 lbs; 29 cu. ft. (217 gals.) hopper volume. Hopper load is 1000 lbs. The Ag-Cat has been designed to make a continuous 1.5-G turn at dusting speed and at maximum gross weight.

Our model is designed around a 1" scale bringing the upper panel to a 36"

full span. The .29 power plant is housed behind a dummy 7 cylinder radial engine; with a short nose moment all movements of control are most responsive. The model floats in on a monostrut landing gear and a spring leaf swivel tail wheel.

Construction could begin with almost any part of the model. However, we prefer to start with the fuselage since all members fasten to it one way or another. The sides are 1/2" sheet balsa broken and shaped as indicated. All formers aft of the firewall are 1/4" sheet balsa. The firewall is 3/16" plywood. A 1/4" thick disk of sheet balsa forms the nose of your Ag-Cat. The engine is

Big Ag-Cat with 450 hp engine totes 2,100-lb payloads using Swathmaster chemical dispenser (left) made by Transland Aircraft, Torrance, Calif. 220 hp Ag-Cat takes 1,600 pounds.

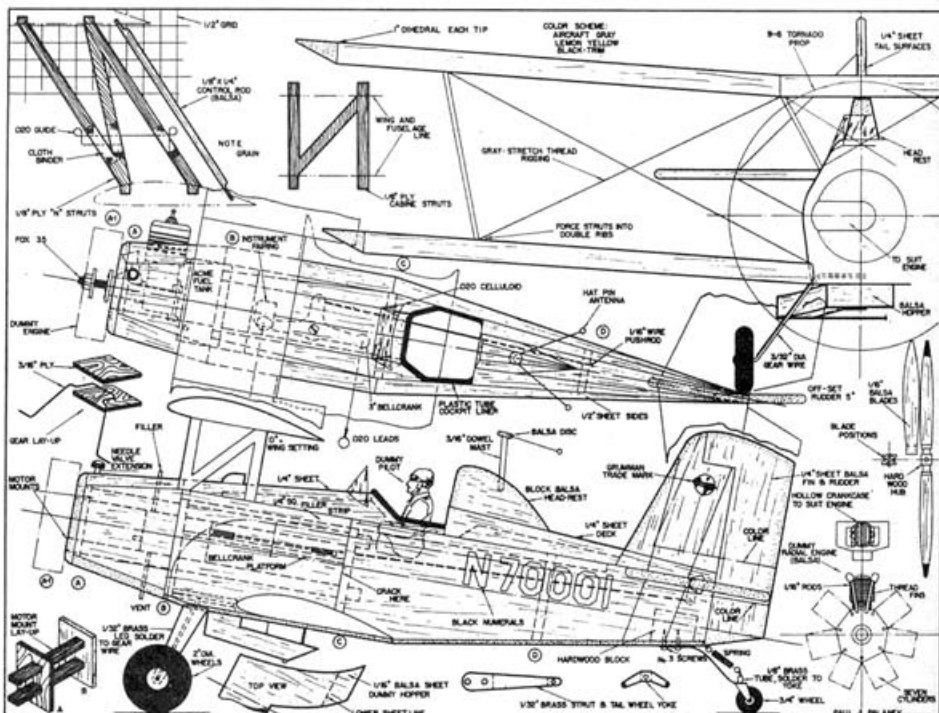
mounted prone; be certain the 3/8" x 5/8" hardwood motor bearers are secured to the fuselage accordingly.

Fasten the 3" bellcrank to the plywood platform as indicated. Secure a 1/16" dia. wire pushrod to the crank with the tail end extending beyond the fuselage. The deck and nose sections are built up from 1/4" sheet balsa laminations, shaped as in the cross sections. Prior to fastening the lower 1/8" sheet covering, fashion the landing gear from 3/32" dia. wire as shown. Sandwich this between two sheets of 3/32" plywood, fasten to the fuselage. At this point, place the Acme fuel tank in position in former "B", secure with cement.

As all this is left to dry proceed with the sheet balsa tail surfaces. Both the vertical and horizontal members are fashioned from 1/4" medium grade sheet balsa. A large Veco horn fastens the cleator halves and these are joined to the stab with cloth hinges. These surfaces carry a full radius on all their edges. Fasten the stab assembly to the fuselage and the fin on top in a previously cut slot. Join the pushrod to the Veco horn. Be certain these additions to the fuselage are cemented well.

At his point, the lower 1/8" sheet covering is put in place. A hardwood wedge is inserted at the tail end of the fuselage, this member carries the tail wheel assembly. Make the necessary cutouts for cockpit, lower wing and proper fitting of the engine. Before setting the fuselage aside, shape from 1/32" sheet brass the dummy landing gear legs, soft-solder to the gear wire.

The wing panels are extremely simple,



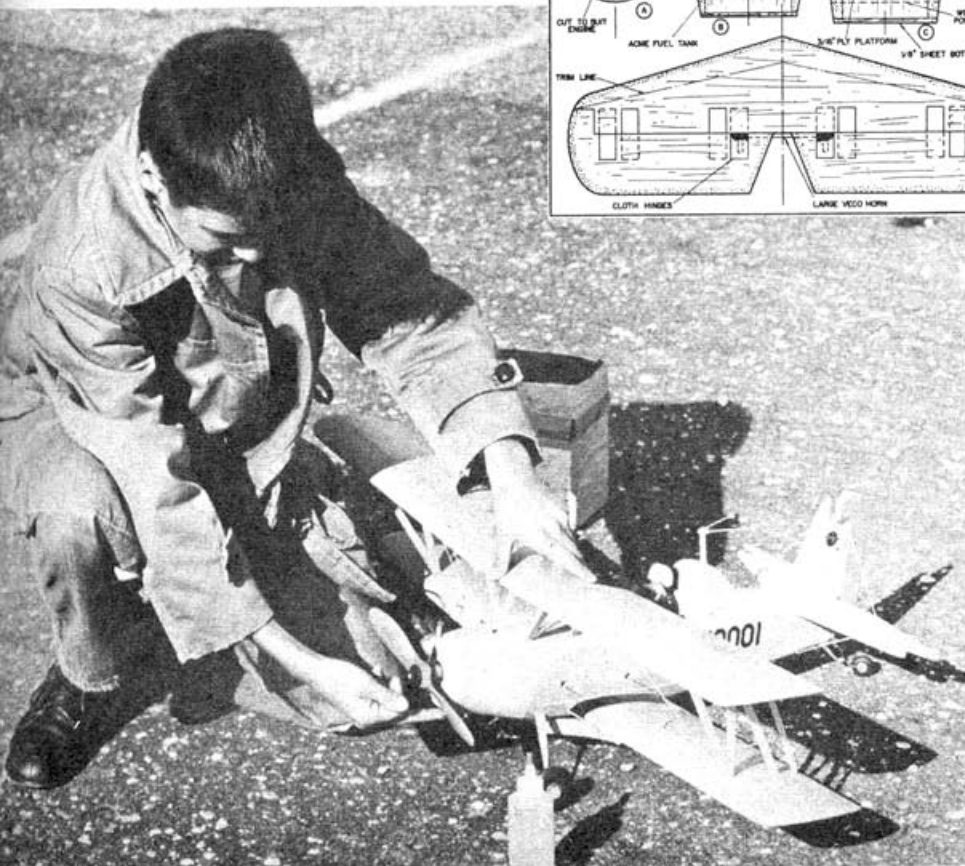
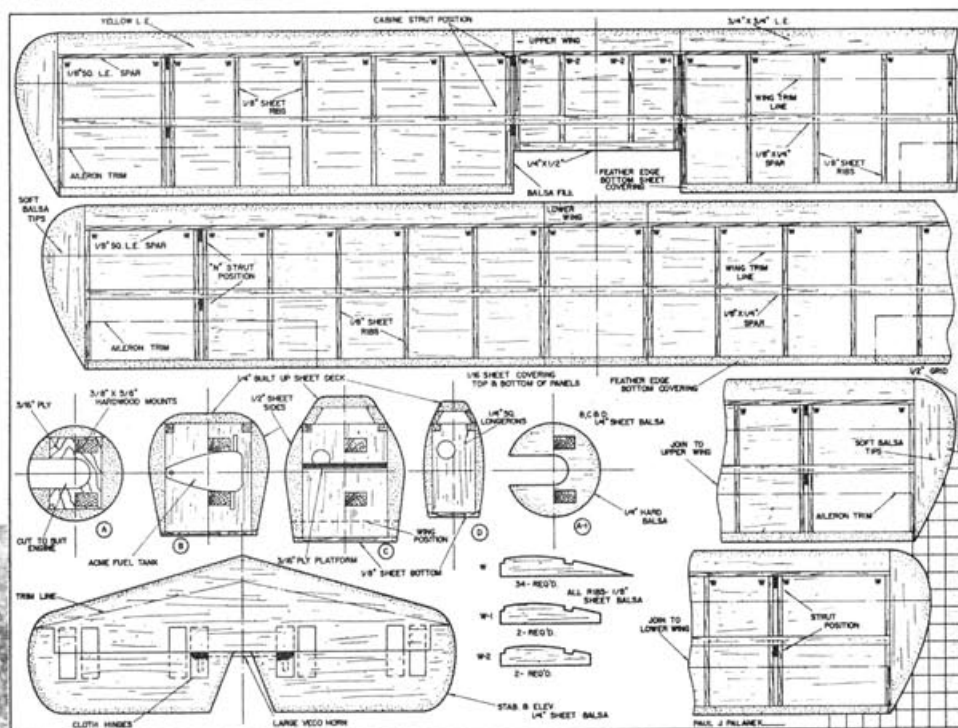
Full size working drawings for the Gruman Ag-Cat are part of Group Plan #461 from Hobby Helpers, 1543 Stillwell Avenue, New York 61, N. Y. (85c). At right young Ronnie Palanek, 12, prepares his Dad's model for flight. Dummy engine has been removed and flying prop substituted for scale exhibition aircrew.

Grumman agricultural biplane with dummy engine and scale prop.



a minimum of structure is employed. All ribs are 1/8" sheet balsa, the leading edge is 3/4" sq. strip; there is no trailing edge. Start by laying out the lower sheet covering of each panel. Shape the leading edge with the proper dihedral at each tip, cement to the lower sheet covering. When dry, add the ribs; follow with the 1/8" sq. leading edge spars and 1/8" x 1/4" main spars. Allow this assembly to properly dry.

With the panel sufficiently dry to work, sandpaper the ribs blending in all rough spots also, feather edge the trailing edge to receive the upper covering. The purpose of the spars is to support the upper wing covering which is 2" and 3" wide sheetbalsa with the joining seams falling on the spars. The wing tips are fashioned from balsa block, 1" x 1-1/2", ce-



ment these in place, when dry shape to proper contour.

Having completed all structures and having brought them to proper finish and contour, apply two coats of clear dope with a light sanding after each application. Cover all wood surfaces with a light grade Silk-span, dopping all over as you proceed. When completed, apply a second coat of clear dope allowing to dry hard at least ten hours. When satisfied, apply four coats of balsa sanding sealer, sanding after each brushing. All surfaces receive three coats of Aircraft gray and two coats of Orange yellow trim. Be certain the lower wing is fastened in place with lower sheet covering added, then proceed. Allowing time for the above to dry, then add the plywood cabine and "N" struts. Both are cut from three-ply plywood, take note of the grain direction, this is important for maximum strength. Assemble the struts between the double ribs, forcing the cabine struts into the fuselage deck. Both wings are set at zero degree incidence. This assem-

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bly must be done with care and proper fitting.

All rigging is stetch thread, gray in color. The wind screen is .020 celluloid,

the pilot is a painted plastic dummy cemented in cockpit. The line guide is formed from .020 music wire, cloth bind to the left wing "N" strut. Add antenna assembly, decal numerals, cockpit liner, instrument fairing and other details now.

The drawing shows the components used in the assembly of the tail wheel. Brass spring leaf is used for the strut with standard sheet brass for the yoke. The yoke swivels in the strut with the spring neutralizing the action. This entire assembly is fastened to the fuselage with two #3 wood screws.

Our completed Ag-Cat carried a Fox 35 power plant; however, a "29" should show excellent results—the difference in weight being of little consequence. A prop of 9-6 proportions will proide good performance. On the field we use 75' lines with little fear of slack. The Cat has tremendous area and, while under complete control, in theory we almost have a free flight on our hands.

You will note photos and plans show a hopper carried under the lower wing along with a 7 cylinder radial engine in the nose. To add to the realism of the completed model these items should be constructed and added. The hopper fashioned from 1/16" sheet balsa is made a permanent fixture of the aircraft. The dummy engine is for display only. In building, the crankcase is hollowed to fit the shaft and washer of the mounted engine. The scale prop is fastened to the engine with a modeler's pin. For the radial, balsa is used throughout. Thread is wrapped around the cylinders to simulate fins. Crankcase and rocker boxes are painted grey, pushrod and cylinders are black. Remember, the dummy engine is removed for flights.

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## AG-CAT BILL OF MATERIAL

(Medium Grade Balsa unless otherwise specified)

One piece 1/2" x 4" x 36" for Fuselage sides; (1) 1/4" x 2" x 36" for Fuselage deck; (1) 1/4" x 3" x 36" for Fuselage formers; (3) 1/8" x 2" x 36" for Wing ribs, fuselage bottom; (2) 1/4" x 1/4" x 36" for Fuselage filler strip; (3) 1/4" x 1/8" x 36" for Wing spars; (2) 3/4" x 3/4" x 36" for Wing leading edge; (2) 1/16" x 4" x 36" for Wing bottom; (2) 1/16" x 3" x 36" for Wing top; (2) 1/16" x 2" x 36" for Wing top; 1" x 1 1/2" x 24" block for Wing tips; 3/8" x 5/8" x 24" Hardwood for Engine mounts; 3/16" x 5" x 24" Plywood for Formers, bellcrank platform, gear reinforcements; 1/8" x 4" x 16" Plywood for "N" struts cabine struts; Scrap block balsa for Dummy engine and scale prop.

Misc. items—3" bellcrank; Acme fuel tank; wheels; 1/16" and 1/32" dia. wire; nuts and bolts; sheet brass; solder; cement; clear and colored dopes; Silkspan; stretch thread rigging; large Veco horn; dummy pilot; decals; .29 engine; and 9-6 Tornado prop.

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