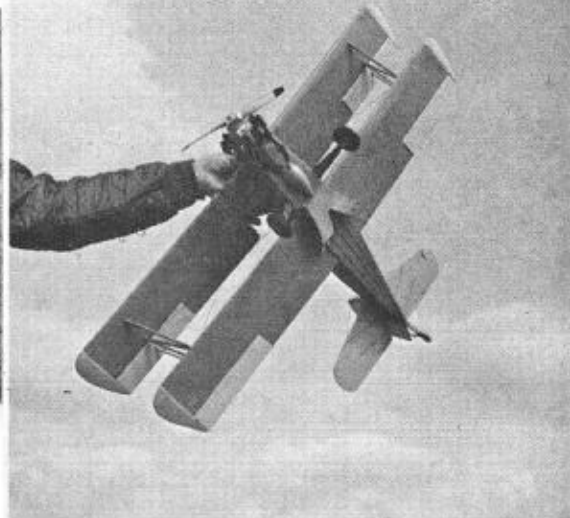




Structure has been kept as simple as possible, with scale-like spacing and open frame realism.



Bob's "Ag-Cat" is a work of art, small, light, offers inspired performance with a .35 engine.

Bob Adair's

GRUMMAN "AG-CAT"

Builds into a very fine, contest proven Controlline Scale. In flight it displays much of full scale Ag-Cat's abilities . . .

Radio oriented modelers might get ideas, the "Ag-Cat" is famed for slow-speed acrobatics.



Scale rib spacing, stringers on the fuselage, sheet structure underneath. Practical framing.

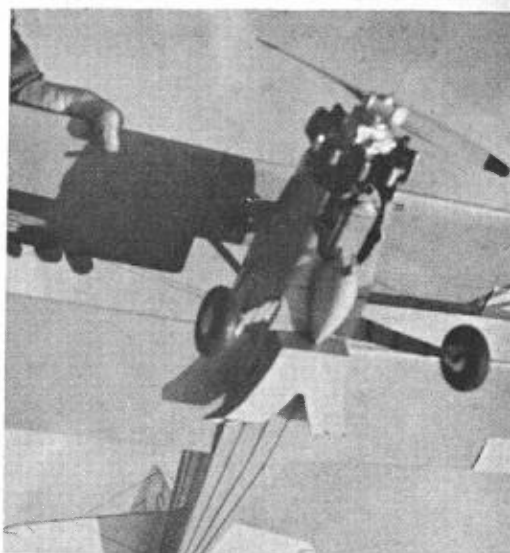
You might wish to rig the ship for spraying.

FULL SIZE PLAN AVAILABLE THROUGH "MODEL PLAN SERVICE"

◆ This model was designed and built with only one contest in mind, the 1965 Air Force World Wide Model Airplane Championships. As I planned on entering about 15 events at this meet, the main criteria of this design was simplicity. The Grumman "Ag Cat" appeared a natural for my purposes due to the relatively easy access to reliable scale documentation, as the ship is in current production, along with the straight forward lines of the ship and the easily duplicated scale features. Additionally it was felt that the model would be a good flyer for the full size craft is. The only miscalculation concerned the weight of the finished model, it weighs only 38 ounces and has a tendency to float on power-on landings, build yours heavy and it should cure this one problem area.

I would like to say that the "Ag Cat" lived up to my expectations of winning the scale event at the 1965 Air Force World Wide, but it didn't as it wasn't quite finished; the basic construction and finish was done, but little scale detail was added, so it ended up in second. Later in the year with some more detail added it again place second at the "Eastern States Model Championships" held at Johnsville N.A.S. During 1966 with more detail added the contest rec-

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Aero .35 engine in cowl. Others are suitable.

"AG-CAT"

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ord improved and the "Ag Cat" won first at the Air Force World Wide, also it either won or placed at every local contest entered in the New York City area.

After mentioning the "Ag Cat's" successes I would like to point out that I do not consider myself as a specialist in scale competition and took a flyers point of view in building the model, with all those events to fly at the Air Force meet, I couldn't put up with any unnecessary critical frills. This should make the cat appealing to you sport flyers who want to fly a straight forward biplane with good flying characteristics.

The quickest way to get your "Ag Cat" Flying is to start on the wings and tail surfaces before getting into the fuselage construction. Wing construction is fairly straight forward, egg crate construction is used on the leading edge and front spar, this method automatically lines up the ribs if you are reasonably careful in notching the leading edge and spar. Don't forget to use $\frac{1}{16}$ " plywood ribs at the wing strut and cabane locations.

The aileron controls should definitely be installed if you anticipate entering scale competition, a modified Veco Bellcrank was used as the heart of the system. The proper moment arms and the height of the pivot anchor may vary slightly from the drawing but with a little experimentation the proper ratios should be found. The sheeting should be applied with white glue to eliminate the shrinking tendency of conventional model cement which causes sagging between wing ribs.

While the various wing panels are drying, the horizontal and vertical stabilizers may be constructed. After cutting the $\frac{1}{16}$ " sheet profile to shape the

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ribs and edges are cemented on after the cement has dried, sand to shape, and cover as outlined later in this article, if building for sport some time may be saved by eliminating the built up surfaces by substituting $\frac{3}{16}$ " medium grade sheet.

The body obtains most of its strength from skin stress construction and should be assembled in the following sequence. First cut out formers #1 through 5. Note that former 1 is laminated from $\frac{1}{2}$ " plywood and balsa. Do not notch the plywood former as this is added later on. On many scale model designs I have seen in the past, I have noted that in general the bodies are built around either a crutch or some type of keel, which in many cases is removed as the body takes on form and strength. I chose a combination of both keel and crutch methods to gain enough rigidity to form the curved $\frac{1}{2}$ " sides.

After cutting out the center hole for the keel and notching the sides for the crutch the formers are slipped on the $\frac{3}{8}$ " square keel and pinned in place, do not glue as the keel is removed so as to leave the cockpit area open for scale detail. Glue the $\frac{1}{8}$ " x $\frac{1}{4}$ " crutch stringers in place and allow to dry thoroughly before proceeding any further. The sides should be cut about $\frac{3}{16}$ " over size which should be enough to allow for the curvature, any excess is trimmed off when dry. Just before applying the sides, the outer surface should be dampened with water on the areas that will have the largest curvature. This will cause the outer surface to swell and curve the sheet to match the formers with very little stress. Be sure to apply both sides at the same

session or warpage may occur, also use white glue to prevent shrinking tendencies.

Once the sides are dried the bellcrank supports should be glued in place and the bellcrank positioned. A Roberts system is recommended for both competition and sport flying. The horizontal stabilizer should be glued into place and the controls hooked up, after this the tail wheel assembly should be epoxied in. Using white glue, install the landing gear plywood bracing and mounts, the landing gear should be installed next, this should be cut from a good grade of aluminum as it is fairly small compared to the profile of most landing gears used on control line models. When using the gear I was somewhat apprehensive, however it has lasted out two years of flying with no signs of weakening, so it is felt that the time saved by the method over a faired wire gear paid off. I had some trouble finding the proper aluminum sheet, so the gear used was cut from an A.J. Walker "Fire-Cat" gear.

The lower wing should be installed next. Be sure the ailerons are working smoothly before gluing in place, also check the wing incidence, it should have 6° positive. The top and bottom fuselage sheeting may be put on at this point. However, do not completely sheet the portion from the cockpit forward as access will be needed when glueing the cabane struts.

The upper wing can be easily installed by cutting location jigs from $\frac{1}{16}$ " sheet, these should be traced directly from the side view drawing. Pin the jigs about halfway out on the lower wing panels, then pin the top wing in place, and epoxy the cabane and wing struts in place. After these are dry, the aileron connecting struts may be installed.

The sheeting on the top front of the body should be added now. When this is dry the fuselage should be sanded and the cowling cut free. Once the cowl is detached it should be braced immediately to preclude any warping tendencies. Once this is taken care of the motor mount pylon should be epoxied in position. Aero .35 engine was chosen for this model due to its unique shape and size. When installed as shown, it fit with very little of the engine protruding, and although not completely enclosed, it does not detract from the scale effect as much as a conventional .35 engine of conventional layout would. Another benefit of this engine is its smooth running characteristics, it doesn't continually jar the scale detail loose. If you choose to use a conven-

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"AG-CAT"

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tional engine the pylon mount coupled with a Tatone radial mount is suggested as an alternate, using this method the entire front cowling may be kept in one piece.

By this time the model should be ready for covering and finishing. The horizontal and vertical stabilizers should be double covered with light-weight Silkspan before installation, however the wings should not be covered until they are permanently on the model. Admittedly, it's a little more difficult to cover and finish this way but the strength gained through good strong glue joints has paid off on the original model as it has survived a couple of cartwheel landings on a grass field. (The little scale sized wheels don't roll very well in grass.) For durability, the wings were double covered, first with silk and then with tissue. This should be accomplished by first applying the silk in a normal manner and the silk is given two or three coats of dope to seal the pores and strengthen it. The tissue should be applied as soon as the last coat of dope is dry to the touch. It is applied wet, and doped down at the edges only. After the tissue dries it should be doped to the silk by using almost pure thinner, the thinner will soften the dope on the silk and will result in a covering job with the strength of silk and the finish of paper.

The model should now be finished using your favorite materials and method. I don't really have any set procedure for finishing, as I am always trying to get a better finish with less work. To date I am still using the basic Hobbyoxy method that was used in finishing the original model. I won't repeat "John E. Poxys'" wonderful instructions here, as I feel epoxy finishing is now pretty well understood. There is one little bit of extra work on this model that couldn't be eliminated though and that is duplicating the external triangular skin bracing of the fuselage panels. This was done by first finishing the body and then adding the strips and refinishing.

Scale detail should be added now, the type of flying and your own ingenuity will dictate how much time you will want to spend on those point getting details. Perhaps you will want to test fly it before going any further. Before flying check for balance, the balance point should not be beyond $2\frac{1}{4}$ " from the leading edge of the top wing. Naturally a calm day should be chosen for the test flight, so that you can acquaint yourself with the characteristics of your engine, throttle, and tank, as well as the pleasing mannerisms of your own "Ag Cat". To me the most satisfactory portion of the entire project was watching the "cat" on its maiden flight, as it assumed the characteristic nose-down flight attitude of the full sized craft. I hope that your model will give you the satisfaction that I have received from mine. ●