



Cessna Agwagon

There's a certain similarity of low level aerobatics between crop dusters and controliners. This super-simple profule type captures the essence, with stunting capability/**Larry Kruse**

Those of us who live in the midwest probably have more contact with specialized agricultural aircraft than those who live in a more metropolitan setting. I've always been particularly fascinated by the performance of ag spray planes as they make their runs scant feet above long rows of crops and then climb out sharply, engines bellowing, to clear the trees or power lines at the end of the field. Time and again the ag pilot brings his craft right down on the ground and then right back up in a swooping 180° turn, not unlike the maneuvers of a Controline Stunter going through the pattern.

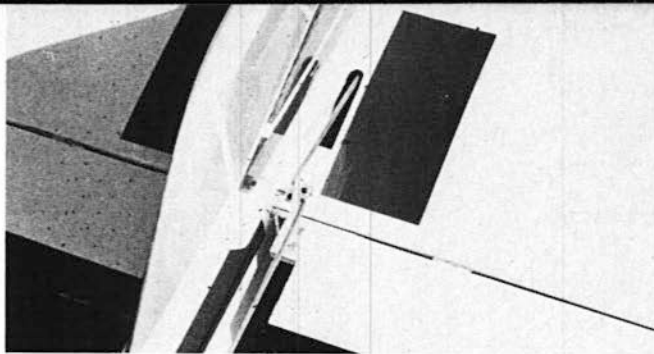
In fact, it was this similarity that prompted me to design this plane around the "AG wagon," one of three agricultural aircraft produced by Cessna Aircraft Company of Wichita, Kansas, the world's largest manufacturer of ag planes. The overall appearance of the AG wagon has been kept intact as much as is possible in a profile, while the planform and moments conform to contemporary competition Stunt ships. With its tall "greenhouse" canopy and its distinctive trim scheme, the AG wagon is a good choice for out-of-the-rut flying.

Construction

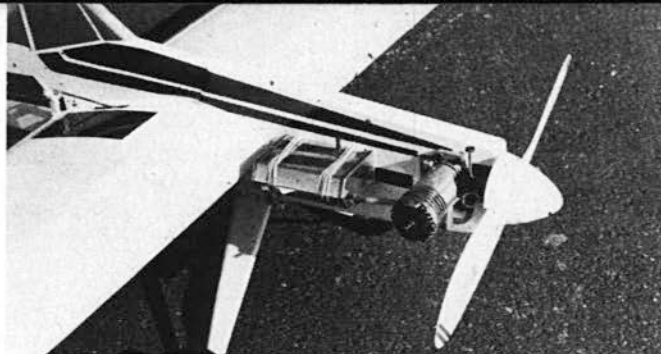
The profile fuselage is of 1/2" balsa. One 36" x 4" sheet can serve for the main fuselage, but the canopy area will need to be added from scraps in your woodbox. The maple motor mounts should be epoxied in place once the fuselage shape is sawed out. The nose doublers are made of Sig 1/8" Lite ply. A substitution of any regular plywood in this area probably will result in a nose-heavy airplane, since the nose moment is so long. An aliphatic resin like Sig-Bond is a good glue choice for plywood to balsa joints.

Once the doublers are dry, motor mount holes, landing gear holes and a hole for the tail wheel wire can be drilled. The canopy area should then be faired and the fuselage

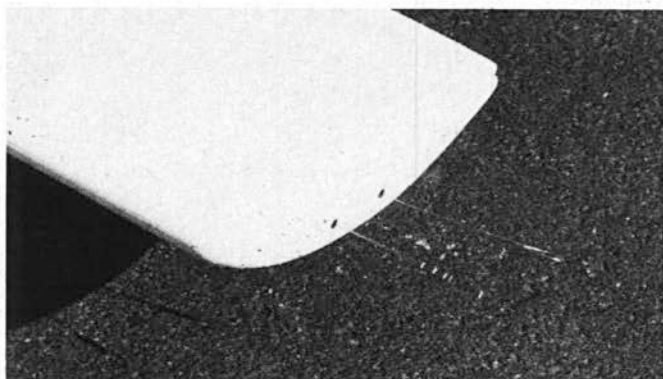
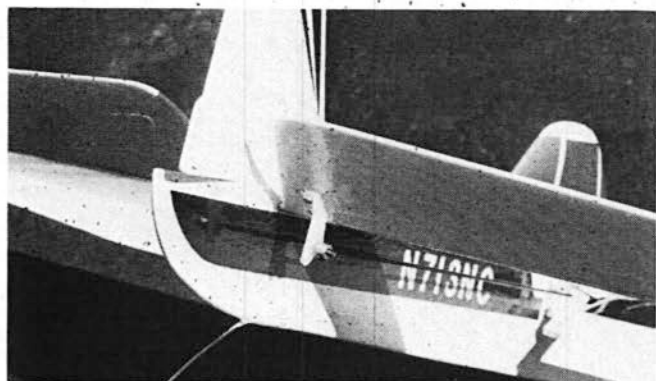




The linkage of the flaps is shown here. Notice the small recess cut into flap to clear the pushrod. Check for clearance full throw. **Beneath:** Nylon elevator horn, Du Bro collar as a keeper. All must function freely, avoid any binding.



The engine has washers under the front lug. It's easily installed. The nylon props are great but should be boiled in water before use to relieve stresses. **Below:** The wing lead-outs seen here, bushed with eyelets.



sanded and set aside.

Rudder and stabilizer are both of 3/16" medium hard balsa. The elevator pieces are connected with 3/32" dia. music wire and the elevator can be hinged to the stab with any commercial hinge or with time-honored "over-under" cloth hinges.

The wing is the heart of any Stunt ship, so take special pains to see that it is built warp-free. Ribs can be cut individually or stacksawed. As a matter of course, I always cut lightening holes in every rib, giving lead-out access regardless of which ribs are used on the left panel or which on the right. The four center-section ribs should be of hard balsa; the remaining ribs should be cut from medium straight-grained stock. As additional pre-assembly steps, make up the spars and leading and trailing edge pieces, epoxying all diagonal joints for strength. You will note that the 1/16" trailing edge pieces both have 1/16" doublers over the joints.

Begin assembly by pinning down the bottom trailing edge piece and gluing the ribs in position. When the first piece is dry, glue the top T.E. piece in place and let it dry also. Spars are next. I've had the best success in creating a warp-free structure by pinning the bottom spar to the plan, fitting the notched ribs over the span (but not gluing them) then gluing the top spar in place. When it is dry, turn the wing over and follow the same procedure for the bottom spar. Admittedly, this extends the wing building period over a couple of evenings rather than doing it all in a bunch, but the wing is straight and warp-free every time. All that remains is to glue the leading edge in place. A great alignment aid in getting adequate pressure on the leading edge so that all ribs are in contact with it is to cut six 4" sticks from 1/4" x 1/4" spruce (Popsicle sticks work well, too) and equally space them vertically behind the spars. Now using several rubber

bands, loop one of them around one end of each vertical stick, go around the leading edge, then loop the rubber band over the other end of the vertical stick. Use as many rubber bands as you need to insure adequate pressure on the leading edge.

To continue assembly, install the bell-crank assembly and pushrods and sheet the center-section of the wing. You may have to dampen the top surface of the sheeting next to the leading edge to negotiate the curve without cracking the wood. The trailing edge capstrip can be glued in place and slotted for flap hinges. The flaps are cut from 3/16" medium balsa and sanded to an airfoil shape. I would strongly recommend the use of a slotting tool such as the one manufactured by Goldberg. I learned a rather expensive lesson once about "eyeballing" hinge alignment. Since that time I always use a slotting gauge of some kind. The flaps should move freely with no tendency to seize or bind as you test-fit the hinges. Do not glue the flaps in place yet, however.

Complete the wing assembly by adding the hollowed out tip blocks and tip weight. Sand the wing carefully, then slip it into the slot in the fuselage to test fit it. If there's no binding or sticking, you're home free. If it does hang up, locate the tight spot and enlarge the fuselage slot in that area.

The Finish

In the last few years, because of time commitments, I've gone to the "quick-and-dirty" route to finishing aircraft. I'm so pleased with the method, that it would take a considerable amount of convincing to get me to pick up a dope brush to finish a sport/stunt ukie. In effect, on the AG wagon the wings, gear fairings, flaps, and tail surfaces were all covered with white MonoKote prior to assemble. The flaps, then the wing were fitted into the fuselage slot, hinges glued in place and the entire wing assembly epoxied into an aligned

position. The tail surfaces were then Hot Stuffed in place and Epox-o-Lite fillets built up around wing and tail joints. The total fuselage was then sanded to my satisfaction, and I brushed on two coats of Hobbypoxy white over all exposed wood. There you have it - one pristine white aircraft ready for any details you might want to add. In this case, all additional color was done with MonoKote trim sheets in blue and silver. The canopy is realistic in silver. The dark blue trim lines provide a pleasing contrast with the white and are arranged in the manner of the full-scale AG wagon. Overall, I'm quite happy with the simplicity and effectiveness of the finish.

Flight Trimming

Balance the plane on the wing spar. Add lead to the nose or the tail until you achieve the proper C.G. If this is your first or second Stunt ship, you might want to move the center of gravity about 1/2" forward of the location shown on the plan. In no case should the C.G. be behind the wing spar. The prototype required one washer under each of the front engine lugs to stay out on the lines during overhead eights. There was no problem with any of the other pattern maneuvers. The plane was smooth and responsive from first flights on.

As an intermediate stunter, the AG wagon compares favorably with any of the production kits such as the Top Flite Tutor, Sig Banshee, or Midwest Magician. It also offers instant identity. The first time I had it out at the flying field, two young boys rode up on their bikes and one of them said to the other, "Wow, look! A *spray* plane! My dad's building a plane, too."

The other boy asked him what kind it was and he said, "I don't know. All my dad's planes look alike. But this one here, though, that's a *spray* plane." Good luck with your AG wagon. Let us spray.

