

Championship form as Nats-winning Don adjusts needle valve before VTO—Vertical Take-off. Is

that engine screaming? What do you think he is squinting for? Favors low incidence for climb.

► Immediately after the 1950 Nationals, when it was evident that the Half A class was becoming a serious competition category, some of the members of the South West Aero Team in Albuquerque decided to design a model of this size incorporating the best features observed at that meet.

Paul Gilliam's Civy Boy design was particularly impressive and the Swat started off having the same dimensions but with altered surface outlines to facilitate construction. During the following five years, the design was flown in contests throughout the Southwest with considerable success. We were also influenced by the Hogan philosophy and the tail-moment arm was shortened and the flat-bottom airfoil was adopted while an effort was made to clean up the external lines of the ship. The fuselage construction has evolved from a built-up truss construction, and corners have been cut everywhere possible in the interest of simplicity and light weight. The temptation to taper the wing tips has been resisted, not due to ignorance of the structural advantages, but to simplify rib cutting and tip construction. The result of this long range improvement program is this lightweight, rugged, high-performance competition machine which put up the highest gas time at the 1955 Nationals.

After building several models which varied only in detail, we reached the conclusion that this could be a boring process and that simplicity and ease of construction were necessary if many planes were to be built, and if good craftsmanship was to be a part of the process. Also the mortality rate for low-incidence models is higher than with the high angular difference or sport

type model. Few experienced competition fliers will deny that the way to get really high is by using as little angular difference as possible and, by using vertical take-off, this has become less dangerous than is generally thought. The engine improvements over the last five years have made necessary changes in the nose-moment arm due to weight and overhang differences, but I prefer the Atwood engines with a micro-tank fuel shut-off system and the plans show the proper dimensions for that system. Various warp resisting wing and stab constructions have been tried during the development period and the one shown on the plan has proven to be best with respect to simplicity and warp resistance both.

The pictures show geodetic wing construction, that is, with ribs crossed over X-fashion to resist warping. Conventional ribs may be easier to build, as shown on the plan. A detail shows how to assemble the geodetic ribs into the wing.

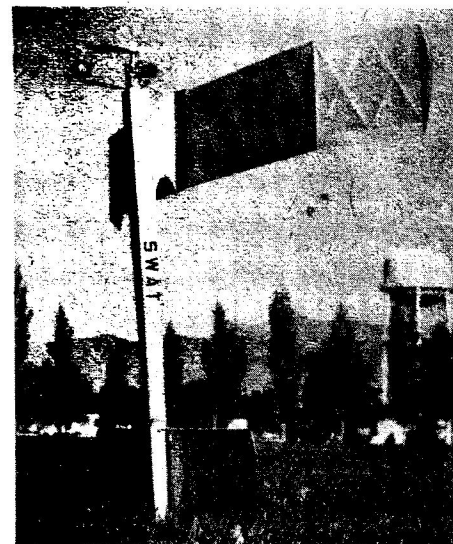
Even if this is your first competition free flight model, no difficulties should arise in the construction. An aluminum template of the wing and stab rib is well worth the time it takes to cut it out and will allow the ribs to be sharply cut and evenly notched. After the ribs have been cut from soft sheet, the right wing half can be built backwards on the plan, since spar locations are already into the ribs.

Light, straight-grained wood is a necessity throughout the wing if the 4.9 ounce limit is to be met. To put dihedral into the wing, just prop up the tip to the indicated dimension, trim the spars and edges to match, and glue a strip of hard balsa (Continued on page 34)

SWAT!

by DON ALBERTS

They combined the Civy Boy and the Hogan and racked up the highest gas time at the 1955 Nationals. Five years development in this Half A.



Grasshopper's view of potent Half A in take-off position. Plan shows optional wing framework.

Picture yourself on the launching end of this homesick angel! You get mostest for leastest.



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Swat

(Continued from page 19)

across the joint before gluing the dihedral joint rib into place. The stab construction is identical, but lighter wood should be used if it is available. Sloppy fits in the construction and planking can never be hidden, so a little time spent here will be worth while. After cementing the pylon into the fuselage bulkheads, the top planking is added and the firewall is cemented in place and reinforced as shown. A brass strip with nuts soldered to match the engine-mounting screws can be cemented behind the firewall and the necessary holes drilled at this time. After planking the bottom, round off all the corners on the fuselage and carve and sand the wing and stab to final shape. The rudder, wing and stab mounts can now be made and shaped and put aside till after covering.

Before covering, give the entire model, except the ribs, a coat of clear dope and sand smooth. Dope a small piece of nylon to the firewall and trim it to extend one half inch back on the fuselage as a reinforcement.

Cover the fuselage, wing, stab and rudder with jap tissue. Grain of the tissue runs spanwise on wing and tail, any direction on the fuselage. Wing and stabilizer then are lightly water-sprayed before application of the first coat of clear dope. I use bulk clear nitrate or Testors clear, thinned half and half. Brush on five coats, sanding after every other coat, then finish off with two coats of Tuff fuelproof (Stanzel), also thinned half and half. Incidentally, steaming warps in or out of the flying surfaces is not effective in very dry climates like ours, because such warps will change, upsetting trim considerably. I build on a sturdy, flat board, don't pre-stress any member unless absolutely necessary, then live with any warps that result. Cement the mounts and rudder in place. Trim, in the form of tissue letters and stripes, can be added at this time. An excellent article on tissue letter cutting appears in the April, 1954 issue of MAN, and it does give the model a more finished look. Give the entire model about five to eight coats of thin, well-plasticized clear nitrate dope followed by two coats of Tuff fuelproof, and let this age as long as possible before getting hot fuel on it. After the landing gear and various wire fixtures have been made, a VTO stick can be made from bass wood and held in the aluminum tube by a rubber-band over the fuselage to the hold-down dowel as shown on the plans.

Before attempting to fly the Swat, turn the fuselage upside down on a flat surface and measure the angular difference between the pylon top and stab platform. This angle should be less than one degree to obtain the performance necessary to put the plane into contention. Lay the model upside down, resting the pylon on a flat board. Trim the top surface of the pylon until the front edge of the stab platform is 1/16 in. higher than the aft edge. Also take out any warps and check to see that there is no downthrust or sidethrust to start with. Using the propeller you intend to compete with, try low power flights till you have the model flying straight out with no tendency to spin during the final power burst. Then turn on full power for five seconds and take out judiciously small amounts of wing incidence until the plane climbs at the angle of launch. By thinking out each adjustment change, the low incidence flying won't be hazardous and it seems to be the only way to put a model really high. I am sure that building the Swat will be a quick pleasure, and flying it will prove rewarding.

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