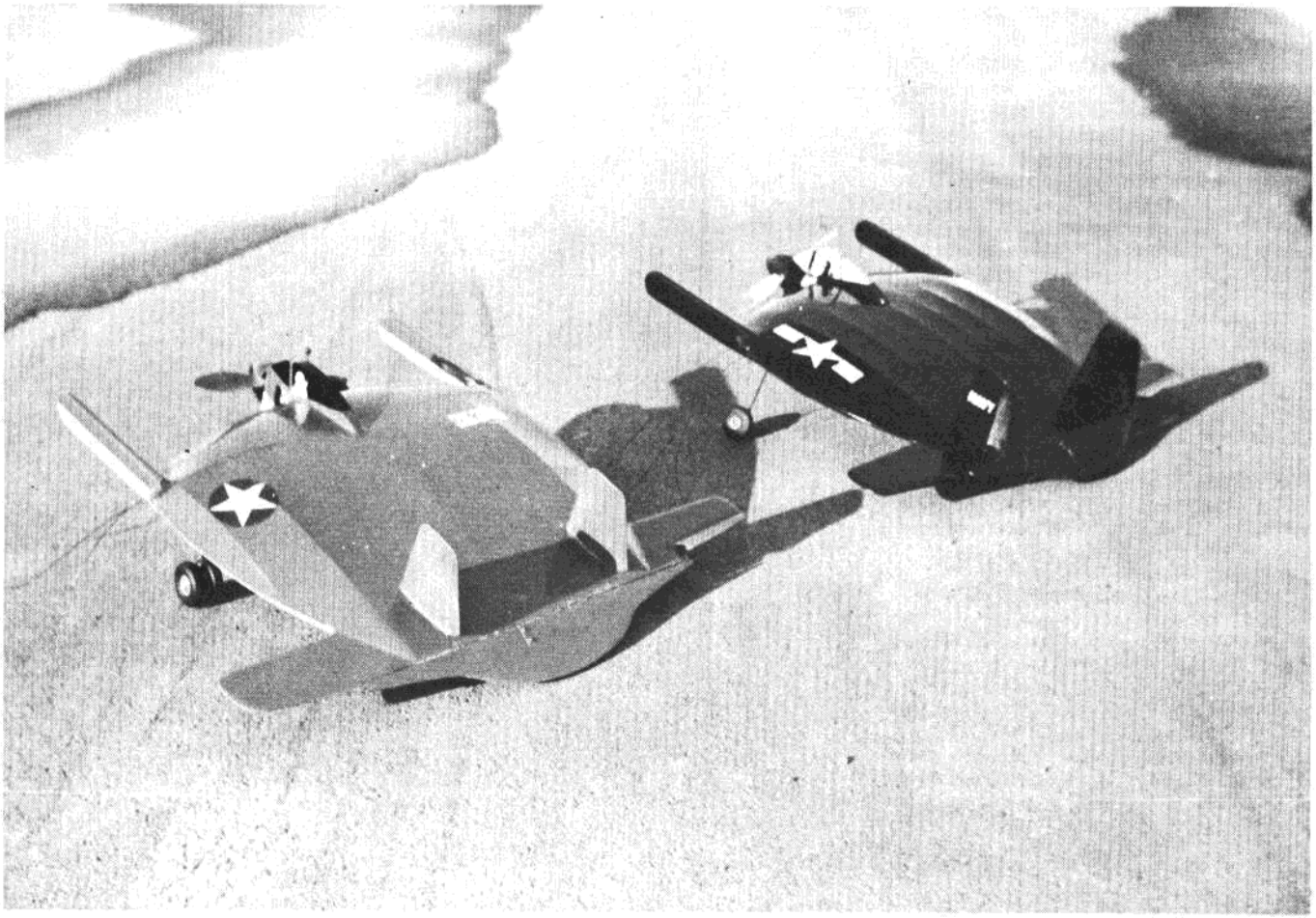
LIMA-BEAN SHAPED FIGHTER WAS BUILT TO BE OUR NAVY'S SHIPBOARD FLEET-DEFENSE FIGHTER. MODEL HAS EXCELLENT FLIGHT CHARACTERISTICS.

Chance Vought 'SKIMMER'



by FRANK SCOTT

Flying saucers were real! In the thirties an engineer named Charles Zimmerman formulated a theory concerning ultra-low aspect ratio wings that would have unusual high lift and low drag characteristics. His work seemed very promising and as a result Chance Vought, a company long known for remarkable aircraft, witness the Corsair, Cutlass, Crusader, etc., built a full-size man-carrying model to check out the feasibility of the radical design. The resulting V.173 aircraft was fairly conventional in structure, even fabric-covered with fixed landing gear, but being most startling in appearance with long prop shafts for the twin propellers protruding from the tips of the lima-bean shaped wing. Towards the rear of the machine sprouted an unlikely looking pair of stabilizers and twin vertical fins. The success of this test airplane led to the construction of a fighter similar in appearance. It is this machine that we are concerned with.

The Chance Vought XF5U Skimmer (one of several unofficial names) was conceived as a shipboard fighter able to take off from small platforms on merchant vessels to defend convoys from attacking aircraft. It would be able to hover over its ship and land again on the platform, almost in the manner of a helicopter, yet capable of 388 miles per hour and having the convincing bite of 6 x 50 caliber machine guns. The conclusion of World War II and the promise of jets brought an end to development and testing and the completed Skimmer was scrapped without ever having been flown.

That was a pity of course, but the plane is nonetheless an intriguing subject for the modeler—unless you are the arch conservative type.

This distinctly odd configuration offers several points of interest to control-line modelers. It is definitely not a "run of the mill" design—one does get a bit tired of "Guardians." More important it possesses the good high and low speed characteristics necessary for a profile carrier model. The engine may be fitted snugly against the firewall to provide a measure of streamlining not ordinarily possible with an uncowled engine. Additionally, all equipment is easily fitted within the capacious structure, thus reducing drag. In high-speed flight then, the machine is well streamlined. However, during low speed, a remarkable aerodynamic transformation takes place. It is characteristic of generally delta-shaped wings that as the angle of attack increases—as in slow flight—the drag produced rises dramatically. Such is the case in this model and a bonus is that the large radius leading edge keeps the air flowing smoothly all the while thus making for a very stable and docile model throughout all flying speeds.

The single non-scale centrally mounted engine was chosen in order to keep things light and simple. In flight it detracts little from the appearance of the model. The structure is strong, rigid and, if built without warps, will remain that way.

Construction

The construction sequence is perhaps as unusual as the model itself, but it is simple, quick and need hold no terror for a modeler ready to advance from the famous "Ringmaster" type of model.

Begin with the heavy central "fuselage-rib." Cut this to shape, add the hardwood engine bearers and all ply doublers—be sure to remember the small tail doublers. After the glue has dried on these, drill the necessary engine mounting bolt, tailwheel and tailhook holes and install blind mounting nuts for the engine. Make sure your engine fits the mounts, and install the fuel tank as you would on a profile model. Follow with the tail-wheel strut and tailhook. Take care that the tail-wheel will not be in the way of the freely swinging tailhook.

The main wing spar is the next item. After cutting out the spar from strong 1/8" sheet balsa, the plywood landing gear mounts and bellcrank mount are glued in place. When the glue has dried, the landing gear struts may be secured to their mounts and the bellcrank with cable leadouts mounted.

Make up the two rear spars from 1/8 x 1/2" strip balsa and cut out all remaining ribs, firewall, tip pieces, leading edges and stabilizers. To save weight, large lightening holes should be cut in the ribs. (There just went a lot of wood!) Notice now that the ribs and spars will interlock to form a very stiff and robust frame. Carefully glue the main spar to the slot in the fuselage-rib (better use slow-drying glue from here on). While this is drying, glue the horizontal stabilizers to the hardwood trailing edge spar and allow to dry.

Glue all ribs to the main spar and add the leading and trailing edges. Then follow with the top and bottom aft spars. Pin everything in place while the glue is drying. Be sure to inspect the frame closely for misalignments or warps, for once this structure has dried there isn't a tea kettle made that can steam out a warp. The wing tip pieces may be added now and this will pretty much complete the outline. Don't be in a rush to put on the dummy prop extensions—they will come much later.

While the frame is still open, it is a good chance to install your throttle control linkage. About the most satisfactory setup is a flexible pushrod, such as Nyrod, passing through the fuselage and thence curving forward to pass over (or under, depending on your engine) the fuel tank and out through the plywood firewall which may also be epoxied in place at this stage of assembly. You may wish to brace this last item wherever possible, and while you have some epoxy glue left over, smear it smoothly all over the firewall and engine area. There just isn't anything better for fuel and oil proofing.

To complete the fuel tank installation, slip plastic fuel line over the filler and vent tubes and, instead of bringing the tubes out the top and bottom of the plane, run the tubes forward out through the firewall. This will not only look more professional, but will eliminate any possibility of siphoning. I didn't think of this in time and my filler tube has siphoned like crazy at high angles as the tube is in a low pressure area.

A bit of wing tip weight attached to the inside of the right tip rib will help keep the control lines tight. The forward portion of the wing, from leading edge to main spar, should be ready for sheeting. Use soft, thoroughly soaked sheet balsa for this. Slow-drying glue, a lot of cutting and fitting, a bunch of pins, and mostly patience will be needed there to handle properly this compound curvature. But when the carving and sanding is done the leading edge will be smooth and immensely strong—which is necessary because of the unusual landing gear location. The 1/16" sheeting at the trailing edge is flat and will cause no problems.

Our attention is next turned to the elevator. Cut out the plywood elevator hinges and glue them in place. Next cut out the elevator from a hard piece of balsa and gouge out recesses for the 1/16" dia. wire hinge pins and attach the control horn in the location shown. Hinge the elevator in the manner common to current combat jobs. While bending the pushrod, keep in mind that the model will normally require a small amount of "up" elevator to fly level since it is a flying wing with a symmetrical airfoil. Thus a few degrees of up elevator with the bellcrank neutralized may be beneficial. Unless of course you intend some inverted flight in which case neutral bellcrank should yield neutral elevator as usual, with equal up and down elevator travel.

Really hard balsa is needed for the dummy propeller shaft housings—the reason being twofold: If you should nose over on landing, your plane will be sliding on them; they may tend to resonate at certain engine speeds. This will vary with each model. After the glue has dried, carve and sand the rear portions of these housings to blend with the tip.

The covering support piece on the left underside is there to form a slot in the completed model through which the pushrod and tail-wheel strut pass and to allow the tailhook to be stowed inside. It is a simple matter to arrange a catch on the pushrod so that "blipping" full down will release the hook allowing it to drop.

Your Skimmer should now be ready for covering after it is sanded smooth and given a couple of coats of clear dope. We suggest using a covering fabric, such as silk, rather than paper, as covering the whole model is like covering a huge wing tip. With time, patience, and a Windex sprayer to keep things wet, top and bottom can each be covered in one piece of silk.

After the silk is trimmed, the two vertical fins may be glued into their slots. It's a lot easier than trying to cover around them. A few coats of clear to seal and some light sanding and you'll be ready to color dope.

The actual airplane was painted midnight blue overall, while the earlier fighter mock-up (non-flying) was given the more attractive three-tone blue color scheme.

When you are soldering on your wheels, use only two main wheels rather than the real plane's dual wheels. Indeed the duals look better, but they add that much more drag and more importantly, weight. This weight hanging from the tips of the short wing can act somewhat as a pendulum and under certain conditions cause a strange undulating flight. Incidentally, the longer-than-scale tailwheel strut is recommended to keep the horizontal stabilizers from hitting the ground on bouncy landings.

About all that's left now is to bolt on the engine and attend to the final rites prior to flight. Due to its unusually long chord the "Skimmer" is quite tolerant regarding its CG, though for the initial flying we would suggest that the model balance at the main spar. As you become familiar with the machine, the CG can be progressively moved aft to increase control response if desired. You may be surprised how far you can shift it back.

The success of your Skimmer depends of course upon your engine. The airplane will do its share. Ours have reached 70 mph and will slow down handily to 20 mph. It will easily get off of a carrier deck and its high rate of sink, power off, assures accuracy in landings.

In competition it seems well to fly this airplane as low as you can. Its abundant stability makes this easy, and while flying high may shorten the flying radius, the model will require a somewhat higher angle of attack and this means drag. At low speed the advantage of the longer radius is obvious; in addition, the landing will be softer if you have engine failure while flying "on the backside."