

Sweet-P

Designed by Larry Sward primarily for sport flying and aerobatics rather than all-out racing, this .10 powered airplane could very well be named "fun."

The author's 3 year old son Ryan holds his dad's plane. He is eagerly awaiting the day he can fly the Sweet "P."

The Sweet-P sport pylon airplane was designed with one primary objective in mind -- fun! Sweet-P does not meet the needs of any major competition category nor does it represent a major breakthrough in aeronautical technology. It does, however, fill the need for an easy to build, scale looking airplane that is inexpensive to build and operate. It is also easy to transport, and is capable of carrying a standard size radio control system with two servos. Small battery packs and sub-miniature servos are not required.

Sweet-P is a slightly enlarged 1/2A racer designed around the O.S. Max 10 FSR. It was designed primarily for sport aerobatics rather than all-out racing. It uses a nice thick symmetrical airfoil for excellent lift and soft stall characteristics. The O.S. Max 10 FSR has plenty of power to provide good vertical performance. This airplane was also designed to be as simple as possible to build and maintain. Only two channels were used on the prototype (aileron and elevator). However, a third servo for throttle could be added if sub-miniature servos were used. As a matter of convenience, the aileron servo was installed in the fuselage. While one might think trim changes would occur due to the wing shifting, a snug fitting wing will eliminate this. In the two seasons of flying the Sweet-P, I have not encountered any problems in trim changes with this aileron set-up.

One could safely categorize the Sweet-P as an advanced trainer which any beginner who has progressed past the Falcon stage could easily handle. This applies not only to flying but also building. While it is by no means a complex aircraft to build (quite the contrary), this may represent the modeler's first attempt to cut a foam wing. Don't let the wing be a stumbling block. It can be built in a conventional manner (balsa ribs and spars) if foam cutting equipment is not available. This can be accomplished by stacking the appropriate number of rib blanks between the two rib templates shown on the plans and carving to shape. However, a foam core sure makes for a rigid wing that is light in weight.

Construction

Wing:

The wing cores are cut from lightweight home insulation foam. Cut the root and tip templates shown on the plan from 1/8" plywood. Make sure they are very smooth. Mark the cutting stations as indicated and number them. Mount these templates on a 1" thick foam block of the correct length being careful to align the

By Larry W. Sward

ABOUT THE AUTHOR

Larry W. Sward is 33 years old and has been actively building and flying miniature aircraft since the age of 6. He started building and flying radio controlled aircraft 19 years ago. He builds and flies all types of models -- sailplanes, pylon racers, pattern and scale. He is married to Renate Sward, a Certified Nurse Midwife and they have a two year old son, Ryan -- who is just crazy about airplanes too! Larry is employed as Industrial Engineering Manager with American Greetings Corporation in Bardstown, Kentucky.

SWEET-P

Designed By:

Larry W. Sward

TYPE AIRCRAFT

Sport Pylon

WINGSPAN

43 Inches

WING CHORD

6 3/4 Inches (Avg.)

TOTAL WING AREA

257 Sq. In.

WING LOCATION

Shoulder-Wing

AIRFOIL

Symmetrical

WING PLANFORM

Double Tapered

DIHEDRAL EACH TIP

1 Inch

O.A. FUSELAGE LENGTH

33 3/4 Inches

RADIO COMPARTMENT SIZE

(L) 7" x (W) 2" x (H) 2"

STABILIZER SPAN

14 1/2 Inches

STABILIZER CHORD (incl. elev.)

3 3/8 Inches (Avg.)

STABILIZER AREA

40 Sq. In. (Approx.)

STAB. AIRFOIL SECTION

Flat

STABILIZER LOCATION

Mid-Fuselage

VERTICAL FIN HEIGHT

4 1/8 Inches

VERTICAL FIN WIDTH

3 1/2 Inches (Avg.)

REC. ENGINE SIZE

10 Cu. In.

FUEL TANK SIZE

2 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

2 (3 w/Throt.)

CONTROL FUNCTIONS

Ailerons & Elevator

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa, Foam & Spruce
Empennage	Balsa
Wt. Ready To Fly	34 1/2 Oz. (2 Lbs. 2 1/2 Oz.)
Wing Loading	19.4 Oz./Sq. Ft.

templates properly. Then using a hot-wire cutter, cut out the left and right wing cores. Once cut, skin the leading edge of the wing with 1/16" balsa. After the leading edge is skinned, join the two panels ensuring the 1" (each tip) dihedral is correct. After the panels are joined, install the 1/8" square balsa trailing edge support and the remaining center sheeting and rib capstrips. Next add the 3/32" plywood wing tips, 1/16" plywood tip supports (T1, T2, and T3) and the 1/4" balsa filler blocks. Add the second 1/8" x 1/4" trailing edge support and the 1" x 1/4" trailing edge. Shape and fit the 1" x 1/4" ailerons and the 1/8" x 1/4" spruce leading edge. Shape and fit all sections of the wing. Once the wing has been finally shaped and the ailerons, control horns, and hinges fitted, reinforce the center section with 2" wide fiberglass or nylon cloth. This completes the wing except for adding the fuselage fairings and covering.

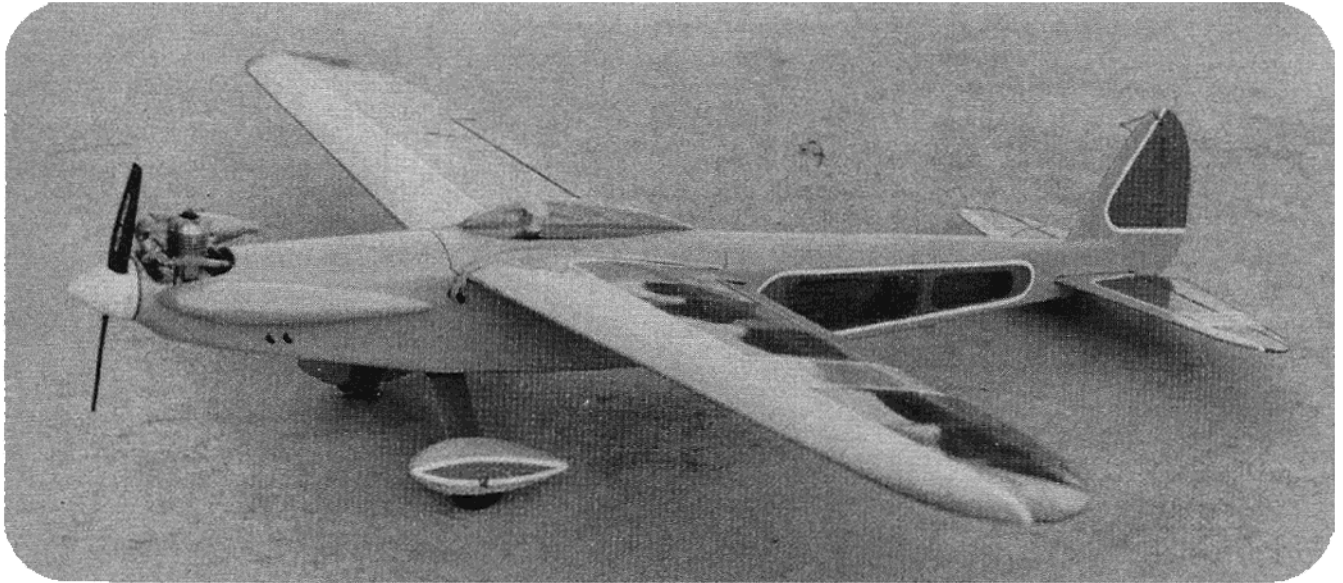
Tail:

The tail surfaces are very straightforward. Cut all main pieces from light 3/16" balsa sheet. Assemble directly over the plans and add the 1/8" x 3/16" balsa ribs as shown. When complete, shape to final contour. Don't be afraid to sand the tail. You want to keep it as light as possible. Connect the two elevator halves together with a 1/8" hardwood dowel. Finally, install the hinges for the elevator. This completes the tail surfaces except for covering.

Fuselage:

Cut all fuselage formers, doublers and sides as shown. Using contact cement, secure the 1/64" plywood fuselage doublers to the sides as indicated; then add the 1/8" x 3/16" balsa longerons. When dry, the fuselage is ready for assembly. Place the left and right sides on top of each other and hold the tail together with a clothespin. Next pull the sides apart and position former F3 as shown. Prior to gluing, position the fuselage upside down over the top view of the plan. This will help in maintaining proper alignment. Glue former F3 in position with white glue (an aliphatic resin like Titebond is excellent). Clamp in place using C-clamps with blocks or with Kraft clamps. Next, position & secure former F2. Let both of these formers dry before continuing construction. Once these formers are dry, pull the nose together and secure the 3/16" plywood firewall as shown. Use epoxy to secure the firewall in place. When the epoxy is cured, glue the fuselage sides together at the tail.

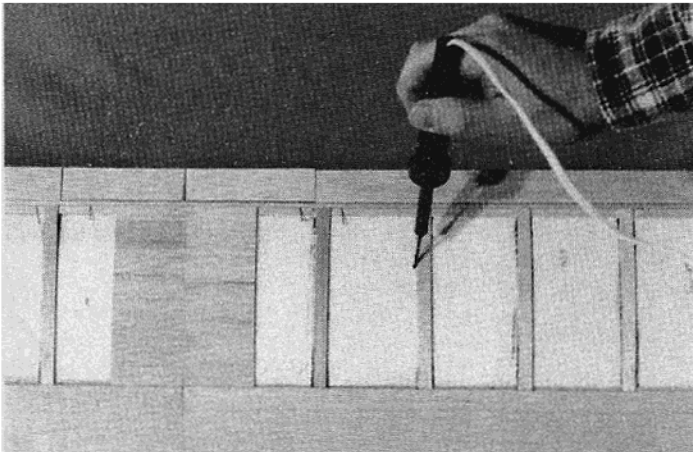
With the fuselage still over the plan upside down, add the 1/16" balsa bottom sheeting from former F2 to the tail and the 1/4" balsa bottom sheeting



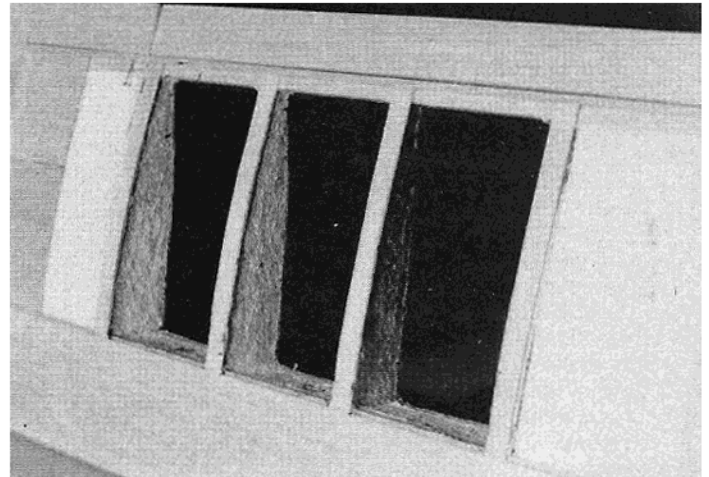
from the firewall to former F2. When the sheeting is dry, remove the fuselage from the plan. Now add formers F1A, F3A, F4, F5 and F6. Then add the top sheeting. When dry, trim and add the balsa tail filler block, the nose cowl balsa blocks and the

1/16" plywood nose ring. Shape the nose block per plan and hollow out to fit the engine and engine mount. Next add the 3/16" plywood gear mounting block and the 3/16" plywood gussets. While this may look a little excessive for mounting the landing gear, it is not

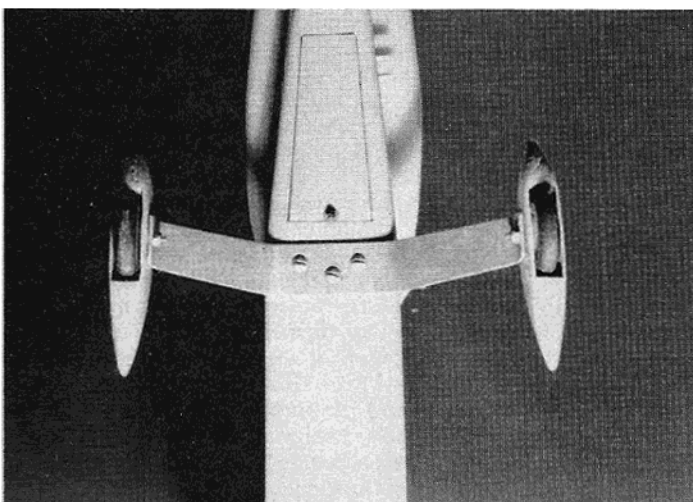
if you are flying from rough fields (like grass). The landing gear can really take a beating on a rough field. Also, add the 3/32" plywood wing saddle doubler. Drill and install the 1/8" hardwood dowel wing dowels. Finally, mount the wing with rubber bands



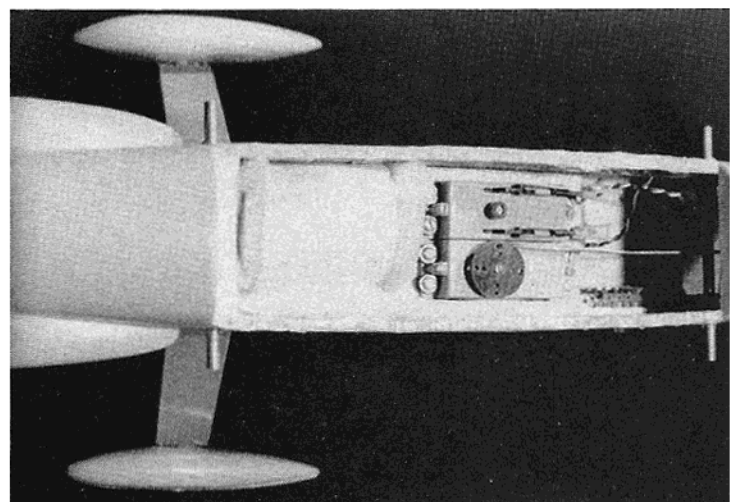
A modified pencil soldering iron was used to cut the foam out between ribs. A standard iron tip is drilled to accept a 2" length of #10 house wire.



A close-up of three completed rib bays. When completed, the wing is lighter than a solid foam wing.



The removable landing gear and fuel tank access hatch make for easy serviceability.



The aileron servo is located in the fuselage for simplicity.

free with no binding.

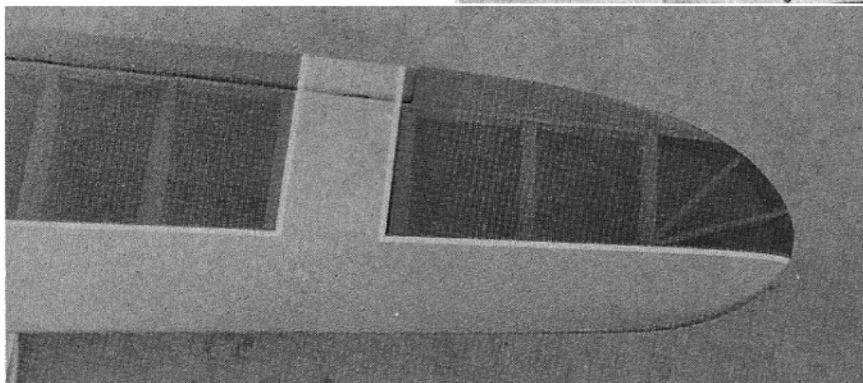
Flying:

Test run the engine prior to flight. I always run at least one full tank through the engine on the ground to fully check out the fuel and pressure systems. The original used muffler pressure and a Master Airscrew 7 x 4 prop. After the engine is checked out, range check the radio and check all control functions. Sweet-P is ready for flight only after a thorough pre-flight check is complete. Hand launch

The cheek cowls are positioned so as not to interfere with the muffler of the O.S. Max .10 FSR.

and check alignment. Build the fuselage fairing on top of the wing. I like to build the fairings with the wing mounted since this ensures a nice snug fit. Since the aileron servo is in the fuselage, a snug fit is required to maintain proper aileron trim. Prior to covering, install the 8" Sig canopy, the cheek cowls (optional) and the stabilizer and rudder to the fuselage. Fabricate the landing gear from 1/16" x 1" x 10" aluminum as shown on the plan. If you don't have any aluminum cutting tools, a Sig landing gear blank may be substituted. Wheel pants can

The completed airframe is ready to cover. It is simple, light and strong.



Sweet-P directly into the wind. It will take a pretty good heave, so don't be timid about giving it a hearty throw. Be cautious, however, to make sure it is thrown straight with wings level and not with the nose up or down.

Wing tip detail reveals simplicity. The plywood tip provides exceptional strength and light weight.

be added to spruce up the appearance of Sweet-P. These are laminated from five layers of 1/8" balsa and sanded to shape. They are cut out to clear the 1/2" Ace wheels.

Covering:

The original was covered with Super MonoKote. The wing and tail were covered with transparent and the fuselage was covered with a combination of opaque and transparent. Be sure and choose a good visibility color scheme. Since the

airplane is rather small in size, visibility is very important. I also put a wide strip of opaque MonoKote on one wing. This helps the flier to tell if the airplane is coming or going!

Final Assembly:

Install the engine and radio as desired, adjusting the radio location to achieve proper balance. The prototype required no nose or tail weight. Set the controls as follows: ailerons 3/16" up and down, elevator 3/8" up and down. Check to ensure that all controls work

Conclusion:

I have enjoyed the Sweet-P over the last two years of flying and have found it to have no bad habits. It is ideal for small field flying on a minimum budget. I hope you will find the Sweet-P to be as enjoyable to build and fly as I have. Happy flying! □

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