SWEET SWEEP INSTRUCTIONS

GENERAL – The Sweet Sweep was designed by Lester Grogan and Ken Hale in 1953, and literally terrorized control line combat in the Southwest for the nearly five years, particularly when flown by the designer, Ken Hale and Bill Cummings (the 1956 Senior National Stunt Champion). It was originally kitted by L & H Hobby Shop of Seagoville, Texas. The Sweet Sweep was a **TOUGH** combat plane to build without a serious wing warp. Construction difficulty of the Sweet Sweep was probably the main factor limiting a more widespread success. The precautions taken in these instructions to avoid misalignment and warps may seem like “overkill”. If you choose to ignore the warnings -- proceed at your own risk.

The Sweet Sweeps of the 1950’s were mostly silk covered and powered by Fox and Johnson “Combat” .35’s and K&B “Green Head” .35’s. Finished, ready to fly weight was 17 to 20 ounces. This is an important factor to consider before beginning construction of your Sweet Sweep. The K&B “Green Head” .35 weighed 7.65 ounces. With modern construction materials & techniques such as CA adhesive, carbon fiber and film covering, a 15 ounce Sweet Sweep is easily attainable. In spite of the appearance of the front end of the Sweet Sweep, it has a **VERY LONG NOSE MOMENT**. In order to maintain the CG, an engine weight of 5.0 to 7.0 ounces is advised. A strong .15 to .25 Schnerle on 15% nitro will deliver more speed and performance than any 1950’s Sweet Sweep.

**STEP 1 – MOTOR MOUNT AND WING SPAR ASSEMBLY**
Before starting assembly of the motor mount & wing spars, cut a piece of 1/8” scrap balsa the same height as the center notch of front wing spar and insert it into the front spar slot and wrap with tape to prevent spreading the engine mount while mounting the engine. This is a good time to verify the fit of the bellcrank into the slot in the motor mount (it’s easier to grind out some clearance now than when the ribs are in place). Drill mounting holes and install blind mount nuts for your choice of engine. The O.S. .25FP shown fits the motor mount without any trimming. (See Fig. 1, 2 & 3)
Identify the Inboard / Outboard ends of the plywood wing spars. Now is the time to decide the type of fuel tank you want to use. If you want to use a metal fuel tank, it can be permanently installed on the outboard side of the engine mount and between the wing spars at this point. Brodak’s BH-538 or BH-547K (1” x 2” x 2 ½”) will require cutting away the outboard R-1 rib between the plywood spars. Brodak’s BH-547K (a tank kit) is probably the best choice, since you will have to make a modified fuel pickup tube to clear the engine. **Do not cut the spars to make room for the fuel tank! The plywood spars are a main source of strength of the wing!** Assemble the spars to the motor mount (with the fuel tank, if required), taking care to maintain alignment and squareness. (Slow cure epoxy here). (See Fig. 4, 5, & 6)

Carve the nose block, hollow out to clear the engine crankcase and glue in place. (See Fig. 7 & 8)

**STEP 2 – WING CENTER SECTION ASSEMBLY**
Carefully tape the plans to the top of your work surface (without wrinkles). Protect the plans from damage during the next steps by placing a strip of clear Scotch Tape over the printed wing rib positions to allow tacking the wing assembly to the plans with CA adhesive. Note that the wing ribs have a rectangular tab on one side. **DO NOT REMOVE THESE TABS AT THIS TIME. IF A TAB GETS BROKEN OFF, USE MASKING TAPE TO HOLD IT IN PLACE.** These tabs provide alignment during wing construction. **NOTE:** Due to an error in laser cutting the aft end of the alignment tabs interfere with the bottom T.E. sheeting. Relieve the aft end of the alignment tabs 1/16” to allow the T.E. sheeting to be properly positioned. Identify the center ribs with spar slots, verify the wing spar fit into the center ribs, and mark ribs (R-1, R-2, R-3) before
beginning wing center section assembly). If you are using a metal tank, cut away the outboard R-1 wing rib between the spar slots for tank clearance. Carefully slide the R-1, R-2, & R-3 ribs into position, (alignment tabs **DOWN**) verify position and squareness, and tack the alignment tabs of the ribs directly to the plans and glue the ribs to the spars. The R-3 rib butts up to the end of the front spar. It is not necessary to glue on the forward section of the R-1 & R-2 ribs on the outboard side as shown. Only the “Half Rib” is positioned at the outboard end of the engine compartment.

(See Fig. 8, 9, & 10)

**STEP 3 – INBOARD & OUTBOARD WING PANEL ASSEMBLY**

Now that the center section is complete, align and tack R-4 ribs at the end positions. Bevel the rear edge of the (4) 1/16” x 1 ½” trailing edge sheeting as shown on the plans. Add the **BOTTOM T.E. SHEETING** (not the TOP T.E. sheeting as shown) Glue the center section ribs and the end ribs to the bottom T.E. sheeting.

(See Fig. 11, 12, & 13)

Add the remaining R-4 ribs, align for position & squareness and tack the alignment tabs to the plans. Add the top & bottom 3/16” square spars. Glue all ribs to the spars and bottom T.E. sheeting. Add the TOP T.E. sheeting, using slow drying glue. Add the ¼” square L.E.

(See Fig. 14, 15, & 16)
Carefully mark the position for the front leadout guide on the inboard ¼” square L.E. and drill the leadout guide hole with a Dremel. Mark the inboard wingtip for the rear leadout guide. Cut away a 1/8” strip where the wingtip is marked so that the leadout guide can be sandwiched in the wingtip between two pieces of 1/32” scrap plywood. Assemble the inboard tip. (See Fig. 17, 18, & 19)

Taper the aft end of the wingtips to fit into the trailing edge. Glue the wingtips in place. (See Fig. 19 & 20)

Glue the wingtip weight in the outboard wing panel. Glue the extending T.E. sheeting down to the wingtip and trim excess. The original Sweet Sweep instructions specified a 3” bellcrank with the pushrod hole 3/8” from the pivot. (That’s still good advice) Mark the wing ribs and cut the leadout holes. (Note: the use of solid wire leadouts and a Brodak 3” nylon bellcrank worked very well with no binding in the prototype) Install the bellcrank
and leadouts. The two R-1 wing ribs will have to be slotted to facilitate bellcrank/leadout installation. Work the controls and correct any rubbing or binding. (See Fig. 21, 22, & 23)

If you are using a pen bladder fuel tank, NOW is the time to install the pen bladder housing in the outboard wing forward of the 3/16” spars. This can require cutting away the outboard end of the aft plywood wing spar. If you cut away any of the plywood spar, you will need to add reinforcement to restore its strength. Sand the ¼” square leading edge to match the wing rib contour. Wet the outside surface of the TOP leading edge sheeting and glue in place on the wing panels (white glue is advised) The wing assembly is to remain tacked to the plans until the top L.E. sheeting is dried and the white glue is set. (See Fig. 24, 25, & 26)

Once the top leading edge planking is fully dried, trim off the excess wood. NOW carefully remove the wing from the plans where the alignment tabs were tacked down on the tape. Flip wing over and lay the wing assembly on the work surface (alignment tabs up and add the Bottom L.E. sheeting. Secure the bottom L.E. sheeting until the sheeting is dry or until the white glue has set enough to flip back over. Temporarily put a light weight on the wing assembly if it doesn’t lie flat on the work surface. When the bottom L.E. sheeting is fully dried, trim off excess and sand edges flush at the tip ribs. NOW carefully break off the wing rib alignment tabs. Some CA glue may have seeped into the perforation, so be careful not to break the “good” part of the wing rib. Add the 1/16 x ¼ cap strips. Using the (4) angle-cut tip leading edge sheeting pieces, glue in place and trim. (See Fig. 27, 28, & 29)
Temporarily install the pushrod and plank the center section – both sides of the wing center section with 6 pcs. of 1/16” sheeting. Be careful to use the correct pieces provided in the kit. (See Fig. 30, 31, & 32)

**STEP 4 – FUSELAGE ASSEMBLY**

Mark the inside of the fuselage bottom planking and fuselage sides with marks for the former positions, then carefully glue one fuselage side to the bottom and then install the formers in their correct places. Once done, glue the other fuselage side to the fuselage bottom & formers. The fuselage top is left off for now. Make a trial fit of the partially assembled fuselage to the wing and verify that the pushrod has clearance through all the formers. Cutting a slot above the pushrod hole makes it easier to install the pushrod and complete the assembly. Work the controls and make bends where necessary, correcting any rubbing or binding. Add a small piece of scrap balsa to cover the notch then sand flush with sides. (See Fig. 33, 34, 35 & 36)
Sand the stabilizer & elevator and install your favorite hinges. Insert the stabilizer into the fuselage slots and make a trial assembly to the wing to verify that the stabilizer is aligned to the wing. Carefully sand the slots to get alignment if required. Glue the stabilizer into the fuselage slots. Tack-glue or pin the fuselage to the wing center section to give yourself the ability to make adjustments. Once satisfied permanently glue the fuselage to the wing then add the top fuselage planking in place. Glue the 1/8” balsa fin/rudder in place. Attach the control horn to the elevator and connect the pushrod. (See Fig. 37, 38, 39 & 40)

For added strength, apply epoxy/fiberglass (or graphite) around the nose section.

**STEP 4 – FINISHING, Do not glue the “Wing Fences” to the leading edge until the wing is covered!**