

## Electric 1/7<sup>th</sup> Scale Globe Swift GC-1B by Dennis Sumner



In keeping with my love for seldom modeled general aviation aircraft I chose to model the Globe Swift. I really liked the “grin” of the GC-1B Swift so chose that model. There are a number of great color schemes to pick from. The color scheme for my model is a Globe Swift owned by The Swift Foundation Museum in Athens Tennessee. <https://swiftmuseumfoundation.org/>

My Globe Swift has a 50” wingspan and has 390 square inches of wing area. The model is all balsa and plywood construction and features a fully sheeted wing with 85 degree E-Flite retracts, 3/16 balsa tail surfaces a fully sheeted fuselage with a large removable hatch for battery changes. A short kit is available from Manzano Laser Works (<http://manzanolaser.com/>) and includes the stackable cowl pieces, firewall and all formers, wing ribs and a canopy. Here’s the link to my build thread on RC Groups for more details and pictures of the build. <https://www.rcgroups.com/forums/showthread.php?3154728-1-7th-Scale-Globe-Swift>

## Getting Started:

**Fuselage:** Start by making a template for the 1/16 balsa fuselage sides. Note the dashed lines for the sides. Glue pieces together for the two 1/16 sides. Mark the firewall (FW) and former locations on the insides, make sure you make a right and left hand side. Cut and glue ¼ triangle from F2 to tail. Do for both sides. Cut ¼ balsa longerons from FW to tail. Glue in place from FW to F2 only. Dry fit F3 and F4 to locate ¼ balsa longerons. Glue Longerons to sides but do not glue F3 and F4 at this time. Cut and Glue ½" balsa triangle between F1 and FW. Glue the 3/16 stab support then glue 1/16 tail post. Use the fuse top view to shape ¼ square and ¼ balsa triangle to pull the tail together. Pin the two 1/16 sides together outside to outside to make sure both sides are identical. Glue F1 to the right side at 90 degrees. Use laser cut 15/16 saddle spacers to locate wing saddle from ¼ square longerons. Use Titebond to glue saddle in place. DO NOT GLUE the 15/16 spacers as you will need for the left fuselage side. When dry glue F1 and wing saddle to the left side. Make sure F1 is 90 degrees to side. Working over the top view of the plans glue in F2. Block up the fuselage so the ¼ balsa longerons are level. Then use a square to verify the FW is 90 degrees to your board. Sight from the top to insure no right or left thrust then glue in place. Slide F3 and F4 in place using the alignment marks you made on the sides. You will need to bevel F3 and F4 to fit the sides and ¼ triangle. Glue F3 and F4, to the 1/16 sides, from the ¼ longeron to the ¼ triangle stock. Pull the tail post together and glue, again make sure this is straight using the top view on the plans. Using F2B tool sand and glue F2B onto the top of F2. Glue the three ¼ square balsa stringers on F2B, F3 and F4. Cut the turtle deck sheeting to fit and glue in place. You may need to slightly wet the turtle deck sheeting to bend. Using the plans measure from the back of FW to locate and glue H1A. Glue ¼ square balsa stringer from FW to H1A. Sheet from FW to H1A with 1/16 balsa.

**Removable Hatch:** Make hatch floor from 3/32 cross grained. Use wax paper between H3 and F2B, sand H3 to fit and glue to hatch floor. Glue H3A in place using scrap 1/8 balsa to space from H3. Cut and glue ¼ square on top of H3A and H3. Use wax paper between H1A and H1B. Cut two pieces of 1/8 dowel to locate H1B then Glue H1B to 3/32 floor. Don't glue dowels in until the hatch sheeting has been glued on and sanded. Measure off plans from back of H1B to front of H2, glue to floor at 90 degrees, add ¼ square balsa stringer. Make a paper

template for the 1/16 hatch sheeting. Pin the hatch to flat balsa blocks to glue sheeting in place, take care to keep H3, H3A at proper angle. Fabricate hatch latch from laser cut pieces, 1/16 music wire, 1/16 wheel collar and ball point pen spring. Music wire is flush when lever is pulled back. Fit hatch and let spring latch mark back side of H3 for drilling with 1/16 drill. Leave bottom 1/16 sheeting off until servos and pushrods installed. Leave ¼ balsa bottom front off until wing dowel has been drilled.

**Wing:** Prepare four 1/16 wing skins using your favorite method to join and sand. With bottom skins pinned over plans use alignment marks to draw spar location at R7 & 8. Also measure and locate a small hole to retract mount and wheel opening. Make a template for aileron cover location. Mark and cut opening for aileron covers on both bottom skins. Pin left bottom skin over plan protected with wax paper. Pin 3/16 square bottom spar in place and 1/8 x 3/8 balsa at the trailing edge of the ribs. Make a tapered piece of 3/16 balsa for washout. (3/16 thickness at R11 and 1/32 thickness at R6). The washout shim runs from R6 to R11. Your bottom skins should have the aileron cover hole plus small hole to locate retracts and wheel opening. Glue R1 in place from spar to trailing edge. Use the R1 tool to set dihedral. Glue ¼ R1A in place, this will give support to the wing hold down dowel. Glue R2 and R3 from spar to trailing edge. Dry fit R4, R5, LG1, LG2 and 3/8" square hardwood. Place on skin and glue from spar to trailing edge. Fit and glue remainder ribs and 1/8 lite ply aileron mount. Using a 25 in. piece of scrap trailing edge stock under the bottom skin to roll the skin and glue sheeting to bottom of all ribs. After dry glue top 3/16 spar in place. Add shear webs from R1 to R11. Use painters tape on top of ribs at trailing edge to sand 1/8 x 3/8 balsa to accept top sheeting. Put pull strings in for retracts and aileron servos. Glue top sheeting in place with Titebond. Make sure to leave the washout shims in place and pin and weight sheeting until dry. When dry trim skins flush with front of ribs and glue ¼ x ¾ balsa leading edge in place. Trim and sand sheeting at R1, R11 and trailing edge. Cut and fit 3/8 x 1 ½ trailing edge. When gluing make sure stock is level with and flat with bottom sheeting. Use 6" ruler to check. Shape leading edge and epoxy wings together with 30 minute epoxy. You need to remove material from the leading and trailing edge to get the wing to fit the fuselage, after you get it to fit, draw sand the wing to fuse by taping sandpaper to the wing top and sliding fuselage from side to side to get good fit. Once satisfied check the

incidence with Robart incidence meter. The wing is +1 degree with reference to the motor and stab. Fiberglass the wing center section with three pieces of  $\frac{3}{4}$  oz. fiberglass cloth 2", 3", and 4" wide. I glued a piece of  $\frac{1}{8}$  balsa 1 in. wide at the trailing edge fuse bottom to fair into wing. I used some  $\frac{3}{16}$  balsa on the wing for wing hold down. Drill and tap for 10/24 nylon bolts. I Mount servos as shown on plans, then run pushrod tubes with the plans as a guide. I used DuBro #852 pushrods. Continue cross sheeting the bottom behind the trailing edge with  $\frac{1}{16}$  balsa. Cut out a hatch which has a cooling hole. You can also glue the  $\frac{1}{4}$  balsa sheet on at the bottom front. Cut wingtips from light balsa blocks and glue them on. After sanding wing and wingtips mark out the ailerons and cut them free.

**Tail Feathers:** Cut parts for tail group from  $\frac{3}{16}$  balsa. Glue the rudder and elevator tips on, hinge and sand. After stab is sanded carefully cut in half. Then using dihedral tool block the left side of the stab up and sand the angle to join to right stab. Using dihedral tool, glue stab together with 30 minute epoxy. When this dries glass center section with two layers of  $\frac{3}{4}$  cloth. I used old Sonic Tronics no. 115 super clevis for the elevator linkage. Bend  $\frac{1}{16}$  music wire for tail wheel. Glue music wire into rudder and glass over wire area with  $\frac{3}{4}$  cloth.

**Cowl:** Stack balsa cowl pieces on  $\frac{1}{8}$  music wire mounted to wood blocks. Glue with Titebond for easy sanding. Cut two pieces of  $\frac{1}{8}$  dowel and dry fit on top and bottom of firewall. Mount motor, slide  $\frac{1}{8}$  lite ply cowl back onto dowels and fit cowl stack on, use 1  $\frac{1}{2}$ " spinner to get alignment, mark and glue stack to cowl back. When dry fit and glue  $\frac{1}{4}$  magnets on FW and cowl back.

**Final Assembly and Sanding:** Sand wing and fuse, cut openings for retracts and wheels. Check stab incidence to wing and motor. Glue stab on, then fin and shaped balsa blocks. Add balsa block on wing to flair into fuse bottom. Cut canopy to fit, add cockpit details and pilot. Glue canopy on after covering.

After finish sanding with 400 grit paper cover in your choice of film coverings. I used chrome and midnight blue Ultracote on my prototype. Glue hinges in, mount servos and hook pushrods up. Check balance at 2  $\frac{1}{2}$ " from leading edge at fuselage. Fabricate battery tray. Check all controls and set up aileron, elevator at 15 degrees. Set rudder for 15-20 degrees. Manzano carries a nice tool for degree setups. [http://manzanolaser.com/Control-Surface-Deflection-Gauge\\_p\\_3397.html](http://manzanolaser.com/Control-Surface-Deflection-Gauge_p_3397.html)

### **In The Air:**

My Prototype weighed 3 pounds 6 ½ ounces. I set the elevator and aileron throws to 15 degrees and the rudder to 20 degrees. The take-off was straight and needed only a couple of clicks of down and one click left aileron. For first flights take it up some and do a practice stall to get the feel for how slow you can fly. I usually limit first flights to about 5 minutes and land to check everything over to make sure nothing has loosened up or overheated. If you build your own Globe Swift send some pictures or post on my RC Groups thread. Densmodels@gmail.com

### **Specifications**

Model: Globe Swift GC-1B

Type: Electric Sport Scale

Wingspan: 50 in.

Wing Area: 387 sq. in.

Weight: 3 pounds 6 ½ ounces

Wing Loading: 20.09 oz./sq. in. 12.26 cubed wing loading

Power Required: Cobra 2820/10 (1170kv)

Radio required: 5 channel (rudder, elevator, ailerons, motor and retracts)

### **Gear Used:**

Radio: Spektrum DX9 with AR 8000 receiver JR SM241 servos for Ailerons, Hitec HS-65 for elevator and rudder

Motor: Cobra 2820/10 (1170kv)

Speed control: Cobra 60A ESC

Battery: Glacier 3S4000

Propeller: APC 10x6 E

Retracts: E-Flite 15-25 85 degree