

Quick E Finish Instruction Manual

Introduction:

The Quick-“E” Finish (shortened QEF) was designed and developed specifically for entry level radio controlled pylon racing in the “stock plane” electric class. The size, airfoil, motor, and other aspects of the plane have been selected to provide the easiest plane to build, fly, race, and crash (hard to crash, but easy on the wallet if it does!) The QEF is a fully balsa sheeted airframe and no covering is required. The finish can be applied using Krylon or lacquer rattle cans by the builder to suit his tastes. As with any design, the builder’s experience typically leads to modifications to enhance the aircraft’s performance. I would caution you against doing so, because any deviations from the design can eliminate its eligibility to race in the club events. Remember that this plane needs to be built to compete against the skill of other PILOTS, not other BUILDERS.

This manual will attempt to guide you along the assembly sequence. This airplane can be purchased and assembled by first time builders, but it is not a training aircraft. First time pilots should start with an airplane specifically designed for learning the complexities of radio controlled aircraft flight and can consult the local hobby shop experts for more information.

Rather than a complete step by step assembly sequence, this manual will highlight particular unique parts of the assembly and discuss some tips and suggestions. While glue is drying on one part, the builder can switch to other parts to keep things going. The entire construction including radio installation can be performed in 6 to 8 hours of building time.

Wing:

The wing is built within the supplied construction jigs which are pinned down to a flat building board. The jigs establish the proper wing dihedral and 2 degrees of washout when located in the proper positions on the plan. Locate the two wing support jigs labeled “In” and the other two without label (which are the “out” ones as shown on the plan). Using CA, assemble them over wax paper covered plans in the shaded outer “boxes” of the outer wing sections. Note that the “In” side must be located on the interior section of the wing on each side.

Next, the wing Sub-LE (leading edge) (the 1/8” shallow vee with the square holes down it’s length) is pinned in place along with the Sub-TE (trailing edge) over the plan on the jigs. Note that the LE at the center is pinned down directly to the building board, while the TE pins to a ¼” scrap “shim” at the center. Glue all the ribs into place (not the outer rib caps- those glue on after sheeting) as shown along with WC-1 and WC-2. Remove the wing from the jig and sand the leading and trailing edge to proper profile without sanding into the ribs (use the Side View of the wing section on the fuselage for reference). Next place the wing back into the jig and locate a piece of 1/16” x 4” x 23” balsa sheeting. The wood will need to be damp to bend and form to the concave/convex profile. Using carpenters

wood glue (Titebond yellow glue or equivalent), thin dressmakers pins and clamps, secure the dampened sheeting to the top of the wing and allow to fully dry (overnight).

The wing is now removed from the jigs and the process repeated to secure the lower sheeting. Thick rubber bands like the ones used to secure wings in place work nicely when located around the rib locations. Slide scrap sticks of 3/8" SQ. by 12" long material stock to the center between the rubber bands and sheeting to help secure it tightly to the ribs and flatten the wing panels as the glue dries. It is very important to sight down the wing to make sure to not glue in a twist at this stage since this part does not utilize the jigs. Once the wing has fully dried, sand the leading and trailing edge sheeting flush (mark the wing dowel location) and glue on the 3/8" shaped leading edge. Next glue the trailing edge to the wing by applying glue to permanently attach just the tip sections outside of the precut aileron location and tack glue the center in place (do not apply any glue in the Aileron location). Remember that the center section between the Ailerons will be removed and "grooved" for the torque tubes in a later step.

Next, you're going to make a lot of balsa dust. Best results will be obtained with 80 to 100 grit sandpaper attached to a flat "T Bar" style sander approximately 12" long or a wood block of similar size. Sand the wing fully, referencing the Side View for proper airfoil shape. Attach the wing tips once your rough sanding is complete and utilize them to finalize your profile while sanding. Switch to 240 and then finish with 400 grit paper for good results.

Separate the aileron from the wing by finishing the laser cuts. Bevel the LE and cut the hinge slots per the plan locations. Bend the music wire torque rods inside your cut 1-3/4" lengths of aluminum tubing, groove the wing TE and Sub TE center sections, and glue them into place with 5 minute epoxy (being careful to not get any epoxy on the music wire). Next, drill and groove the ailerons and glue the torque tubes into place with epoxy, and the mylar hinges with canopy glue (RC-56 or equivalent). I cut my hinges from the clear packing of a Spectrum receiver with good results, but CA hinges can also be used if preferred. Drill the 5/64" hole (where you marked earlier) in the LE for the wing dowel and glue into place.

Fuselage:

Cut the 3/32" square balsa longerons to length over the plan making a set for each side. Pin the two fuselage sides "mirrored" to each other on the side view of the plan. Laminate F-3 and F-4 together. Glue the 1/16" fuselage side doublers (between F-4 and F-5) in place making sure exact placement on each side. Glue the 3/32" strip reinforcements to the fuselage sides using the plans as a reference and the formers for proper placement. Add the balsa elevator tray support pieces at this time. Remove the sides from plan and glue in place former assembly F-4 and F-5 over the top view and glue the tip of the tail together. *TIP:*

Use 90 degree angle supports secured to the building board at each former location and the tail to ensure the fuselage is built perfectly straight. Pull the front together and glue F-2 in place. Glue the sheeting sections together (TS-3 through TS-6 and BS-1 through BS-3) pinned down to the plan. TIP: Use yellow wood glue (Titebond or equivalent) for this assembly sequence as well as the installation of these pieces to the fuselage sides. Using CA will harden the wood at the joint and when you sand later, the balsa will be removed randomly while the joint stays hard. This will make for an unsightly finish and poor results. Wood glue (non-CA) sands great and will allow for proper side alignment time. Secure the parts together while drying with sharp pins.

Glue the plywood hatch support into place along with the wing mount WM-1. Note that WM-1 glues in place leaving 1/16" beneath it for a bead of glue around the base. Glue and pin the top sheeting in place including TS-1 using the hatch (TS-2) as a spacer at this time. *TIP: Do this over the plan to ensure proper alignment.*

Bend the landing gear and glue into place securing with medium CA and spider-wire supplied in the kit. Add the tail support pieces T-1 and T-2 and the plywood elevator tray. Install the elevator servo and run your pushrod of choice out the rear side of the fuselage. Install the lower sheeting behind the wing to the tail. Install the motor and run the motor wires through the precut holes (drill 1/16" through F-2). *TIP: Do not try to remove the motor mount as it appears to be difficult to do so. Drill the mount holes at a slight angle and attach with small, fully threaded spare servo screws. Solder the motor wires to the ESC, attach the propeller adapter and propeller, and do a run test to make sure the direction of rotation is correct. Next, glue the front lower nose sheeting in place and then F-1. Assemble the access hatch according to the plan and secure with magnets. Sand the fuselage to shape rounding the edges along its length similar to the corners of F-1.*

The rest of the construction is straightforward and is detailed well on the plans.

Perform a final sanding with 320 or finer sandpaper and seal with a sanding sealer, Krylon clear or lacquer spray. Sand and apply subsequent color coats to taste.

Locate the equipment to balance where shown on the plan. Control throws on the Ailerons and Elevator are typical 20 degree deflections for maiden flights and then adjusted to suit by the pilot. Do not fly unless the plane balances correctly.

Email any questions or comments to:
Aeroplanes@thefinishcrew.com

Have fun racing and may the best pilot win! See you out there.

