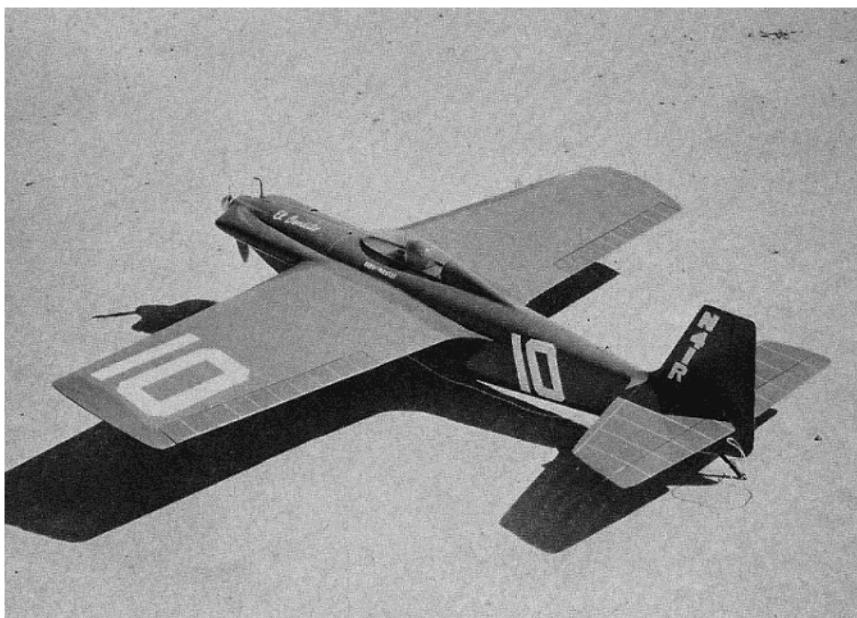
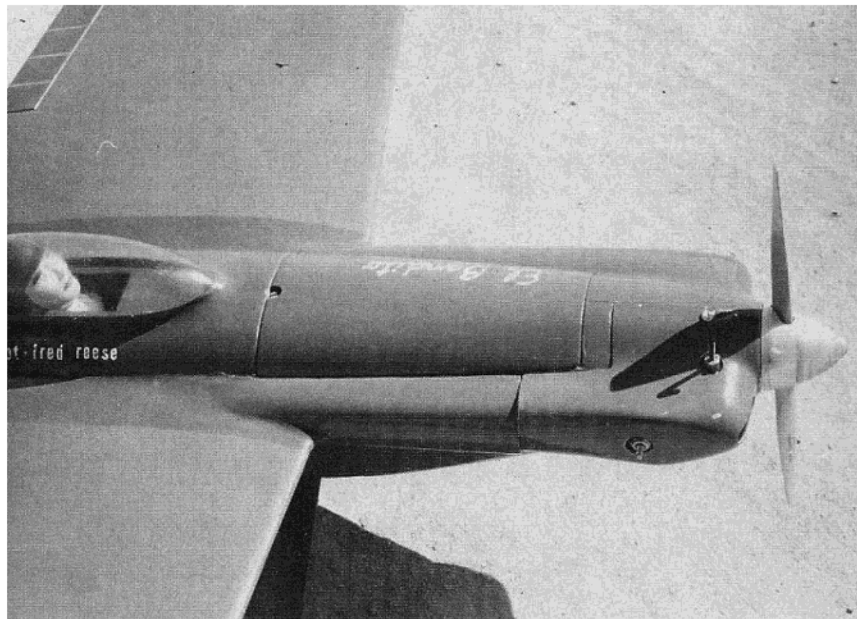
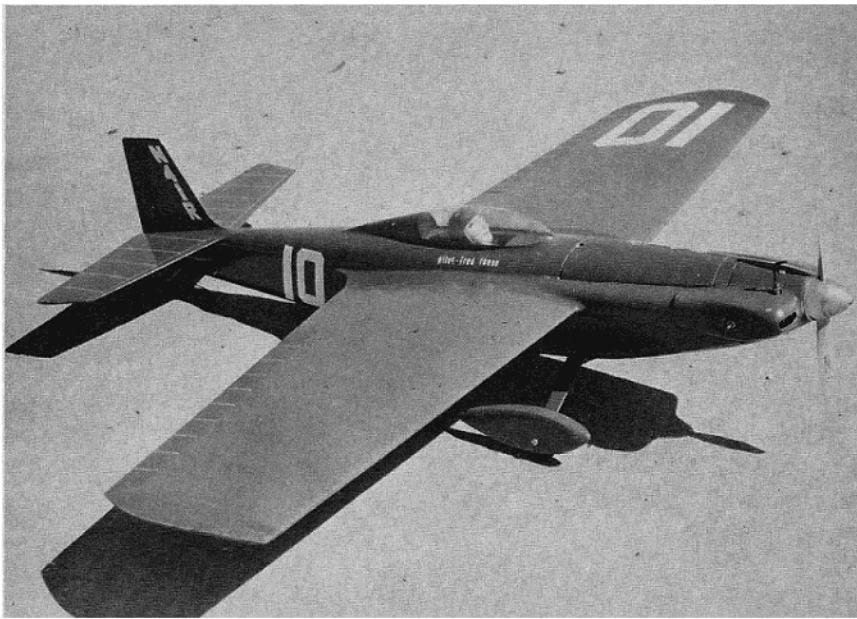


EL

BANDITO

Fred Reese's 1972 High Point Quarter Midget Champion





● The El Bandito Quarter Midget racer is a race-proven design having won three of the last four races entered and ending up as the 1972 QMRC Southern California Champion. The El Bandito has raced against and beaten the fastest Southern California racers. It has turned in the fastest time of the day on a very short course and on a two mile course. The two mile time was 2:07 on a three pylon course.

The El Bandito is very close to my Shoestring design which was published in the June 1972 issue of RCM and was actually built from a prototype "House of Balsa" Shoestring kit. After building two Shoestrings, I knew the design was sound but I wanted something different while still maintaining the same general outlines. The Sleek Frenzel "El Bandito" was the most logical choice as it only involved different tail and wing tip outlines as well as relocating the canopy. The scale color scheme is overall red with a gold spinner and leading edge trim with white lettering and numbers. (Number ten is the scale racing number and also my QMRC racing number.)

The major reason for the success of the El Bandito is the wing. The root section is a very low drag laminar flow symmetrical airfoil which tapers to a lifting airfoil at the tip. The tip airfoil was chosen for its low drag at high angles of attack which really helps in the turns. The El Bandito can easily turn inside most racers and generally has a speed advantage down the straights because of its overall low drag. The wing has excellent stall characteristics which maintains positive aileron control at all speeds and allows very slow, nose high landings. Incidentally, the wing is ten percent which makes it legal by all rules.

My El Bandito is powered by a stock ST .15 FI RC engine which was very carefully and slowly broken-in. A break-in that is too fast will result in a mediocre engine that will wear out quickly. Just running a couple of tankfulls and then, flying will ruin a good lapped engine. The people who are winning are the ones who put out a little more effort than the others. Many of you will be buying the new K & B rear valve .15 now, so break it in slowly and wear ear plugs during any engine break-in to prevent ear damage! Plan on about two to three hours of running time starting very rich and gradually leaning out until the engine will hold a maximum rpm

setting without oscillating. The engine is broken-in when there is no longer any shiny ridge at the top of the piston. When flying make sure the engine doesn't go lean and overheat. It is better to back off than to ruin an engine. My Tigre is currently turning 16,500 rpm with a 7 x 6 Rev-up series 400 prop and K & B 500 fuel and is still improving.

FUSELAGE

For the scratch-builder, House of Balsa makes the "Glass Spar Wing Kit" available as a separate kit for \$11.95 as well as fiberglass cowls at \$4.95 each, canopies at \$1.49, landing gears for \$1.25, and a racing decal sheet for \$1.49, which has all of the racing companies' stickers in a 2" to the foot size.

If you build the El Bandito from the Shoestring kit use the motor mount assembly as supplied in the kit. The plans in this article show a firewall and commercial metal motor mounts for simplicity for the scratch-builder. I used the same wooden mounts as my earlier Shoestring but added fiberglass reinforcement. I cannot impress too much the importance of a solid front end. The motor mounts must absorb and transmit to the entire airplane and dampen the engine vibration or there will be a loss of engine rpm. Consequently I have added 1/32" plywood doublers from bulkhead B through the firewall on the plans. I would also recommend adding fiberglass around the firewall. The top hatch in the plans is shorter than the original, but adds more rigidity to the firewall area. Another, and even better, alternative would be to eliminate the top hatch altogether and make the entire top block in one piece. This would entail removal of bulkhead B after construction to allow tank and battery access but would not be difficult if B were only tack glued to the fuselage sides. After the removal of bulkhead B, add triangle stock above the 1/4" ply landing gear mount. Decide now which way you will build and proceed.

Construction is begun with the fuselage. The wing is built into the partially completed fuselage. The plans show two firewall locations for rear valve and front valve engines. As different brands of engines vary in length, check yours on the intended mount against the plans for fit. Adjust the firewall location if needed. Cut the two fuselage sides noting that the left hand side extends all the way to the spinner. Cut bulkheads B and C from

1/16" plywood and the firewall and landing gear mount from 1/4" plywood. Carefully locate and drill the two 1/4" holes in the fuselage sides for the arrow shaft spars. Glue down the 1/8" square and 3/16" square and the 1/32" plywood doublers and bevel the sides at the rear. Mark the centerlines on the bulkheads and the firewall and then bond in bulkheads B and C between the fuselage sides using the plan top view for alignment. Remember to just tack bulkhead B in lightly if you intend to remove it later. When dry, bond the fuselage sides together at the tail, still using the plan top view to insure the assembly is straight. Epoxy in the firewall and the 1/2" triangle stock, again using the plans for alignment. Epoxy in the landing gear mount and install the blind nuts in the firewall for the engine mount. Add the 1/2" sheet balsa bottom front block and the 3/32" bottom rear sheeting. Tack cement the 3/8" soft sheet top block and the 1/2" sheet balsa bottom hatch into place. Mark the canopy location on the top and leave that area flat when shaping. With a razor plane and large sanding block, shape the entire fuselage except for around the cowl. When finished, remove the hatch and the top block and hollow as shown for lightness. Glue a piece of 1/8" x 1/2" balsa across the rear of the bottom hatch for reinforcement and to key the hatch between the fuselage sides. Also bond in the two 1/8" plywood hatch hold-down plates. Set aside the top block and the lower hatch and begin the wing construction.

WING

Cut a root and tip template from 1/16" plywood and drill the two 1/4" holes. Take care so that these two holes line up perfectly with each other and with the holes in the fuselage. Cut 18 rectangular rib blanks and using the two templates, drill 1/4" holes through all of the ribs. Cut two each of the tip ribs and the root ribs directly from the templates and set them aside. Using 1/4" bolts, bolt seven rib blanks between the two rib templates and carve and sand a stack of ribs. Repeat for the opposite wing panel. Epoxy the two fiberglass arrowshaft wing spars into the fuselage while the fuselage is upside down on a flat surface with short lengths of 1/4" dowels under the spars. At the same time, while the epoxy is still wet, slide on the root ribs and the tip ribs and wiggle the spars until they lay flat on the dowels without additional pressure. When dry, bond the root ribs to the fuselage-sides

and slip on the remainder of the ribs in proper sequence. Using slow drying epoxy, or Titebond, coat the spars at each rib location and move the ribs into the exact location. Place the loose, wet structure back onto the flat surface with the dowels in place and twist the assembly again until the spars rest on the dowels at each wing tip unrestrained. When dry, cut and glue the 1/16" x 1/4" balsa leading edge and the 3/16" square trailing edge to the ribs. With the assembly still flat on the table, add the bottom sheeting and capstrips and allow to dry. Lift the assembly from the table and add the top sheeting and capstrips. Add the 3/8" square leading edge. Make the two aileron linkages from 3/32" piano wire and 1/8" O.D. brass tubing. Cut the two stationary, inboard trailing edge pieces and groove them to accept the aileron linkage. Epoxy the linkage and the trailing edge to the wing taking care to keep the epoxy from the ends of the tubing. Cut and fit the ailerons and the hinges but do not glue at this time. I concave/convexed all of the control surfaces to reduce the air gap using sandpaper and a piece of 1/4" dowel. Add the wing tip blocks and shape with coarse sandpaper. Now go over the entire assembled wing with the ailerons in place with a sanding block and remove any bumps or ridges and fair the ailerons and tip blocks perfectly into the wing.

Permanently bond the top block into place and, if you want a tank hatch, cut it away now. The front of the hatch is held in place with a short piece of 1/8" dowel epoxied into the hatch and keyed into the nose block. The rear of the hatch, as well as all of the bottom hatch, is held in place with 4-40 bolts and blind nuts or No. 6 sheet metal screws. To prevent the screws or bolts from crushing the balsa hatches, short pieces of 1/4" dowels are epoxied to the hatches and then drilled out for the bolts. Inset the dowels about 3/32" so the screw heads will be flush with the surface.

TAIL ASSEMBLY

Join the two sides of the elevator with a piece of 3/16" dowel. Slot the stab and elevator for the hinges and slide the assembly together without glue. Sand the stabilizer-elevator assembly to an airfoil shape as shown on the plan. Do the same with the fin and rudder. Disassemble and, with the aid of a square, epoxy the fin to the elevator on the centerline. Epoxy the stabilizer-fin assembly to the fuselage taking the greatest of care that the

stab is square to the wing and the fin is in line with the centerline of the fuselage.

Add the balsa block cheek cowl and hollow as needed. Rear rotor engines run faster if the intake air is cool. If possible, add a baffle to protect the carburetor intake from the hot air coming from around the cylinder, and supply cool air into the area from a duct in the other cheek. The fiberglass cowl is made directly over a piece of styrofoam that was fit and shaped along with the cheek cowls and the rest of the front end. "Pro-foam" or polyurethane cellular foam is perfect as it is not attacked by polyester resins. If this material is not available you can use any other foam and Hobbypoxy II. The cowl is just one layer of six ounce glass cloth and two or three coats of resin, sanding between coats until the cowl is smooth. After the resin has cured, cut and sand away all of the foam. Where the screws pass through the cowl, glass in washers or small "V's" of fine wire to protect the cowl from wear or cracking. I used No. 6 sheet metal screws into hardwood blocks epoxied to the fuselage to attach the cowl. To get a really good fit of the cowl to the fuselage and cheek, wax the inside of the cowl and add a bead of resin and micro-balloons or other filler around the edge of the engine compartment and then screw the cowl into place and allow to set. This provides a shoulder for the cowl to seat against and reduce the air gap and drag.

FINISHING

After detailing and painting the cockpit area, tack cement the canopy into position. When dry, mask the canopy and smooth a fillet of Hobbypoxy II around the canopy with your finger. Remove the tape before the epoxy sets and no further filleting is needed. Add the 1/16" plywood wing fillets and mix up a batch of resin and micro-balloons and fill and fillet all seams and junctures. Finish off with vinyl spackle and sand with No. 400 paper in preparation for finish.

The wheel pants are balsa cores with 1/16" plywood sides sanded to shape. I used 1 1/2" Williams Brothers military wheels and 6-32 bolts and nuts to attach the wheels and pants to the aluminum landing gear.

The wings are covered with Super MonoKote and the remainder of the airplane was finished with one coat of K & B Epoxy Primer, sanded with No. 400 paper and then one finish coat of K & B Superpoxy color was sprayed

on. Numbers were cut from MonoKote trim and protected with a coat of clear Superpoxy.

Epoxy in all of the hinges and add the control horns. I used plywood horns epoxied and faired into the rudder and elevator.

The radio installation is primarily three servos side-by-side across the fuselage using the center servo for the ailerons and the other two for elevator and rudder. The throttle servo is mounted crosswise, as shown on the plan, or can be mounted along side of the receiver against the fuselage side using an aileron servo mounting bracket.

FLYING

In the beginning, adjust the control surface movement to give 3/16" travel in each direction for the elevator and 1/4" travel for the rudder. Aileron travel can be from 1/8" to 3/16" in each direction. I prefer a slower roll rate as I can fly more smoothly. The elevator is later adjusted for maximum travel without causing the airplane to snap out of a 90°, full up elevator turn. Note: Do this testing fairly high or you may have to start over!

For that first flight please check and recheck all control surfaces for binding, movement, and position of neutrals. Everything should be straight and the engine should be adjusted to give the most reliable slow idle. It does not take much power to keep this airplane up, so you must be able to slow it down to land it, especially if it is out of trim on that first flight. Check the CG with the tank empty and adjust it until correct according to the plan. Do not attempt to fly if the CG is not right. My El Bandito is balanced at the rear point shown on the plan.

For take-off have someone hand release the airplane at full power. Hold up elevator and only add rudder gently, later in the roll-out when needed. Mine begins to swing left after it has rolled about thirty feet and the tail is up. It takes very little rudder to keep the take-off straight. Keep the airplane climbing until it reaches about 200 feet before touching the trims. Once trimmed out, it should fly like it is on rails. There is no tendency to balloon when turning into the wind as do some high lift airfoils. Most impressive is the airplane's speed and smoothness and its ability to corner.

For landings use a long approach as the glide is fast and flat. Start slowing it down early so that by the time it

touches down you are holding full up elevator. The stall speed is very slow and aileron control is positive to the end. □

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