

EEE-Z- FLI P-50+1

BY AL WHEELER

At one time or another, many modelers just have to have a P-51. Many choose to model one of the various military versions, while others elect to be represented in the fast-paced world of air racing. The same basic airplane fits either application, so the choice is yours—the nostalgic days of invasion stripes or the flash and glamour of a Reno pylon polisher.

The version of the classic North American fighter presented here follows the basic concept of the previous EEE-Z-FLI efforts published in *Model Builder*. Ease of construction, use of familiar materials and “polite” flight characteristics were prime considerations. The basic appearance, although not

mance. Ground handling was crisp and precise; even with the scale tail wheel location, take-off tracking was straight. With neutral elevator trim, the tail came up and the airplane lifted off into a gentle climb. A trim flight in the pattern required only one click of left aileron correction. The P-50+1 is stable in both pitch and roll and the rudder has a good handle on any yaw requirements. Slow flight and stall exercises demonstrated no adverse characteristics. With closed throttle, the glide is slightly nose down and the flare and landing fall into the “ho-hum” category, followed by a straight roll-out, easily corrected with a touch of rudder. Later flights have indicated that



Even though the outline has been greatly simplified, there's no mistaking this model's full-scale ancestry. She lends itself well to both military and civilian color schemes. Wing tips could be clipped and a tiny canopy used for a Reno racer look. All sorts of possibilities exist here, so be creative!

truly scale, is pleasing and leaves little doubt as to what aircraft is being modeled. Like previous EEE-Z-FLI designs, repairs, should the ground rise up and bash your creation, are easy and straightforward.

The initial flight of the P-50+1 demonstrated pleasing perfor-

the model is delighted with wheel landings.

With a little power left on, she rolls straight and the tail stays up for what seems like forever, just like the big boys! With the O.S. .25 FP running a bit on the rich side, loops, rolls and their usual combinations are very pleasing.

The model flies smoothly, going where you tell it to with satisfying precision. With scale ailerons instead of the often used full-span type, the roll rate is more scale. Those desiring a faster rate can increase the aileron length inboard when building the wing.

So, if fighter tactics or pylon polishing are your bag, break out the balsa and start cuttin'!

GENERAL NOTES

1. It is a good idea to cut out and number all parts prior to starting construction. If you can find a good looking box, you can roll up the plans, pack the pieces and you have a kit!

2. The EEE-Z-FLL wing construction is quite rigid and resists any corrective warping, so *build it flat!*

3. Component choices such as engine brand, covering material, fuel tank make and general hardware selection are left up to the builder. Specific items

face and assure that the leading edge is straight. Cut hinge slots in both the stabilizer and elevator, but cement hinges into the stabilizer only. Join the fin and dorsal, then slot the fin and

Be sure it is square; sight down the top and bottom for centerline alignment. This is the point at which a lot of good models go crooked and once a crook, always a crook!



The P-50+1 follows the author's basic EEE-Z-FLL design philosophy: flat bottom wing with fully sheeted undersides and partially sheeted top, and sheet balsa fuselage and tail surfaces. Cowl top, wing root fairings and landing gear fairings are bent from soft sheet aluminum. O.S. 25FP used on original.

rudder and install hinges in the fin only. Sand all edges round and put the tail surfaces aside for later fitting and covering.

FUSELAGE

Select two matched sheets of 1/8-inch medium balsa and cut out FS1. Cut FD1 through FD5 from 1/8-inch medium balsa. Cut FB1, 2 and 2a from 1/8-inch balsa and cement the three together. Assemble FB3 with epoxy, using 1/8 balsa and 1/8 plywood back to back. Fabricate FB4, 6 and 7.

Add fuselage doublers FD1 through FD5 to the fuselage sides as shown; be sure to make a left and a right! Now attach FB4, 6 and 7 in the slots between the doublers in one of the fuselage sides, assuring they are square. Fit and install FB5 and the instrument panel. FB3 may now be set in place but not cemented. When dry, assemble the fuselage by laying the remaining side on a flat surface and inserting the bulkheads from the assembled side into the appropriate slots and cementing. Again, do not cement FB3.

Install both FD5s and allow the entire assembly to dry. The rear of the fuselage may now be drawn together and cemented.

Install the aft fuselage vertical members and cross pieces. The rear wedge may now be fitted and installed. Now, with FB2 and FB3 in place but not cemented, align the tops with a straightedge from FB5 forward. Soak the fuselage sides with ammonia and water—and let it really soak in. When wet through, use as many rubber bands as are required to bend the fuselage sides to fit the bulkheads. This may require a bit of patience—and could require repeated soakings.

When satisfied, recheck the alignment with a straightedge on the top, then cement the nose piece (FB2) and firewall (FB3) in place. When dry, install the top stringer from the rear slot in the nose piece to the instrument panel. The bottom of the nose from FB4 forward is now planked with 3/16-inch soft balsa and contoured to shape. Cover the bottom of the fuselage from FB6 aft with 1/8-inch light balsa, cross grain. The two scoop sides may now be installed, the front block and the bottom skinned with 1/8 light balsa. Install the tail wheel support block added inside the fuselage and fit the tail wheel assembly. The prototype used a DuBro #375

unit. Attach the steering arm and run the control wire forward to the approximate rudder servo location to be attached to the servo later.

Install the 3/16-inch plywood W1 and W2 wing supports and the W3 and W4 1/8 balsa gussets. Use epoxy throughout. Install the servo mounts on the top edge of FD3, spaced to accommodate the servos to be used. The top of the fuselage is next covered with 1/16 sheet balsa from FB3 back to FB7. On the prototype the entire area was covered and the cockpit opening cut out later as the canopy was fitted—this prevents cutting the opening too large.

The canopy deck may be fitted and installed once the cockpit opening is complete. No pattern for this, as the canopy used will determine the final shape. The top of the fuselage from FB7 aft may now be sheeted with 1/16 balsa. Note that the sheet stops at the aft edge of the stab and that slots for the stab and fin are required. Trial fit the stab and fine trim the bottom of the fuselage with the fin seated on the top of the stab. Cut the openings for the rudder and elevator pushrods.

The engine mount may now be fitted. To drill the required holes and provide access for mounting screws, etc., cut a hole through the FB2 assembly slightly smaller than the spinner (about 1-3/4 inches). The side of the fuselage ahead of FB3 will have to be cut to accommodate the muffler exit; also, the rear side of FB2 will have to be routed out for carburetor clearance.

Insert two extra long pieces of fuel hose through the firewall and attach them to the tank outlets before the tank is installed; then push on the tank and pull on the hoses and in she goes—slick as can be. There is adequate room below the tank for a flat pack battery.

Sand all fuselage edges round, and shape the nose and bottom scoop to round contours. With the fin and rudder held in place, mark the rudder and back of fuselage for the lower rudder hinge, cut the hinge slots and install the hinge in the fuselage only. On the left side of the nose provide a triangular block for mounting the top cowl. Check the entire fuselage for areas needing more sanding or filling

used on the prototype will be noted in the appropriate section of the building instructions.

TAIL SURFACES

All surfaces are medium hard 3/16-inch balsa. The elevators are joined with a dowel as shown. Join them on a flat sur-

(DAP vinyl spackling). Finish as required and lay aside for covering.

WING

Cut and edge glue the bottom two sheets. With the sheets on the building surface, mark the spar location and all rib positions. Cut the spar to the right length and glue it to the bottom sheet. Install the rear spar. Install the R3 ribs; note that the ones marked R2 on the drawing are notched for the landing gear support and that the ribs at the wing center line are double. The landing gear support may be slid into place from the outboard R2 rib.

Install the R1 and R5 ribs. Note that the R5s are flush with the top of the front spar and 1/16-inch below the top of the rear spar. The R1 ribs are 1/16-inch above the top of the front spar and flush with the top of the rear spar.

Install all R4 ribs; trim ends to fit as needed. Install the inboard vertical landing gear block and the 1/8 ply landing gear support strip. Using a 1/4-inch round file, true up and align the openings for the leading edge dowel in the nose ribs. Assure that the dowel seats on the bottom sheet and cement it in place, being sure of a good joint along the bottom sheet and at all ribs.

Install the three vertical 1/8-inch hard balsa compression strips between the inboard R1 ribs forward of the rear spar. Sand the ribs as required and install the aft center section 1/16-inch balsa skin. It should fit against the front of the rear spar and extend to the center of the front spar. Assure a good cement bond to all ribs.

Check the leading edge ribs for contour and for being flush with the top of the spar. Sand as required and fit the leading edge skin, cutting a jog to clear the center section skin and make it fit even with the rear face of the front spar. Wet the top surface and install; assure a good bond to the top of all ribs and the leading edge dowel. Use tape to hold it in position until dry.

Fabricate the inboard trailing edge piece from from 1-1/2x5/16-inch aileron stock, using a filler piece between it and the rear spar. Sand to fit, but do not attach. Cut a slot in the front edge to accommodate the aileron torque wire tube. Cut the tube to length and cement in place. Groove the rear face of the rear spar as required and attach the trailing edge, being sure that the bottom is flat and parallel to the bottom surface of the wing.

Ailerons may now be cut and trimmed to fit. Cut hinge slots in the ailerons and rear spar, but cement hinges in spar only. Install a piece of Nyrod in the aileron as a bushing for the torque wire. The wing tips may now be shaped and installed. The inboard leading edge of the wing is formed from three pieces of 1/4-inch medium balsa, and don't be afraid to use a bit of DAP spackle. After all, this is not a Scale Masters entry. Shape the bottom and top leading edge skins to form a smooth contour into the leading edge dowel. Recheck the wing and sand as re-

quired. Remember, bumps in the structure are lumps in the covering.

Now build another wing half: opposite please!

When both wing halves are completed, sand the inboard ribs square and at an angle to obtain a good fit with one tip elevated 1-1/2 inches. When satisfied with the fit, puncture a series of holes in both butt ribs for better epoxy penetration. Using adequate epoxy, join the halves, being sure the bottom surfaces are flat on the work surface—there is no point in building in a right or left roll now! When dry, apply three-inch glass tape to the center section, top and bottom.

Carefully measure, mark and drill the three wing mounting bolt holes. Use a 5/32 drill, drilling from the bottom and keeping the drill at 90° to the surface. Check the fuselage wing saddles for fit to the wing and trim as required. Place the wing in the saddles with the leading edge up against the back face of FB4. Be sure the wing is square and centered on the fuselage at the center section. Secure the wing and drill the three holes through the fuselage pads, also with the 5/32 drill, keeping it perpendicular to the wing bottom surface.

Remove the wing, tap the fuselage holes 1/4-20 and drill out the holes in the wing to 1/4-inch. The aileron torque wires can now be installed. Bend the 90° aileron end and slide the wire through the tube from the aileron gap inboard. Slide the ailerons onto

the hinges with the 90° bend inserted into the Nyrod bushings. Center the ailerons and bend the inboard 90° vertical about 1/2-inch from the wing center line. Leave about 1-1/2 inches vertical height. Before bending, check and make sure the bend is close enough to the centerline to clear W1. Check the entire wing assembly and finish-sand for covering.

LANDING GEAR

Using 1/8-inch wire, bend two opposite gear legs. The "strut" effect may be accomplished using fuel tubing secured with a drop of cement and painted silver. The wheels used on the prototype are DuBro 2.5-inch low bounce. These assure that your aircraft will not bounce higher than 10 feet. Standard wheel collars are used. Fit the individual struts into the holes in the wing to assure that they lay flat on the wing bottom surface and that the struts cant forward to place the wheel centers directly under the leading edge.

COVERING

The prototype was covered and trimmed in Super MonoKote. The choice of covering materials and colors are obviously the builder's. The basic prerequisite to a good cover job is lots of sandpaper and a good cleaning to remove any specks and dust. Cut the covering away from any joints to be cemented; this assures a wood-to-wood bond.

ASSEMBLY

Join the stabilizer and vertical fin, then slide the assembly into the slots on the top of the fuselage; check alignment and cement in place. Install elevators. Measure for the filler behind the elevator connecting dowel, assure clearance between the elevator inboard ends, cover and cement to the top of the fuselage. Install the rudder.

Landing gear installation is routine using two "U" straps on each side. The gear covers are installed with two screws at the wing only. Bend them so they spring against the end of the axle. No fastening is used at the bottom because the gear "walks" back and forth on a rough surface. The servos may now be installed and connected. The tail wheel steering wire connects to the rudder servo arm inboard of the rudder pushrod (for less throw). A hole drilled through FB4 will allow the throttle pushrod to pass the fuel tank. The aileron servo is next mounted on plywood mounts and connected to the aileron controls. The canopy may be cemented in place or, in the case of the prototype, two pieces of small triangular stock can be mounted mid-way on the deck and the canopy secured with two #2 screws.

Engine installation and hookup is standard. The radio switch and charge plug may be mounted as you prefer; the prototype mounts them on the left side just below the canopy. Level the aircraft so that the stabilizer is at 0°. In this attitude the wing should seat at +1 to +1-1/2 degrees. This may be adjusted by using shims between the top surface of the wing and the fuselage mount pads. The engine should have two degrees right thrust and no down thrust. Check the operation of all controls and set as follows: Rudder 1/2-inch right and left, elevator 1/2-inch up and down, ailerons 1/4-inch up and down. The engine top cover shown fits the O.S. .25FP and should fit most any engine suitable for the P-50+1.

BALANCE

The prototype balanced at the point shown, without any added weight. Balance should be slightly nose down with the fuel tank empty. As with any aircraft, do not fly it tailheavy! Many otherwise good models have screwed themselves into the local terrain because proper balance was not considered important.

PREFLIGHT

Range check your radio and recheck all control throws, both for correct travel and proper direction. Roll the aircraft on the ground to check for straight tracking and adjust as required. This being a first flight, take an extra minute and tug on all hinged surfaces—it's nice to know they'll be on the airplane for the first flight at least.

FLYING THE P-50+1

Avoid flying in a crosswind on the first flight. Line up into the wind and be positive with throttle application. As stated earlier, the prototype tracks straight and the tail comes up by itself. Unless you have built a banana, neutral trim should be a good starting point. In keeping with its EEE-Z-FLI heritage, the P-50+1 racer/fighter has a "polite" flight envelope and should provide you with a great fun-fly airplane! **MB**