

# CONSTRUCTION

TEXT & PHOTOS BY PAT TRITTE



# FLY BABY BIPE

Experimental homebuilt classic



The Fly Baby Biplane is made of all-wood construction with typical stick-frame style. The wings incorporate the egg-crate rib and spar assembly. The tail section has bowed outlines for a strong light structure. It isn't necessary to remove the Fly Baby's wings for transport. Its one-piece design further simplifies the looks of the plane and keeps the weight down. For a park flyer biplane, it just doesn't get much better than this!

The highly detailed plans contain a lot of assembly and cross-sectional views. A laser-cut short kit containing wood parts and a vacuum-formed plastic cowl and dummy continental engine is available from [patscustom-models.com](http://patscustom-models.com).

## CONSTRUCTION

Take some time and study the plans before building. For a detailed step-by-step description of the process, go to [patscustom-models.com](http://patscustom-models.com). Build the vertical and horizontal stabilizers directly over the plans, then remove them from the board and sand to shape. Make up the hinges by cutting narrow strips of light CA hinge material and dry fit them in place. Don't glue them in until after the model is covered. Bend the tailwheel strut to shape and glue it into the rudder.

Build the left- and right-hand fuselage frames directly over the plans and then glue part B4 in place on the right side, flush with the outer edge. Next, glue the B2 and B3 LG gussets in place. Make up the landing gear beams and form the slots for the landing gear wire struts. Build up the cabane strut mounts and glue them in place onto formers 1 and 2. Score B1 and the top and bottom longerons, and bend the side frames to form the tapers toward the front and rear. To join the side frames, pin the rear landing gear beam over the plan (top view) and glue the side frames in place on the beam.

Add the cross-pieces and formers and then, while the frames are still pinned in place, align and glue the firewall in place. Pull the tail post together and then align the ends and glue. Add the remaining former and then remove the frame from the board and add the bottom cross pieces and the front landing gear beam. The top stringers can now be added to complete the basic frame.

Fit and glue the servo mounts in position and then screw the servos in place. Run in the elevator pushrod tube, make up the main wheel axle and landing gear struts, and then tape them in place. Solder them together at the bottom, then lash the landing gear to the beams with thread and a couple of drops of thin CA.

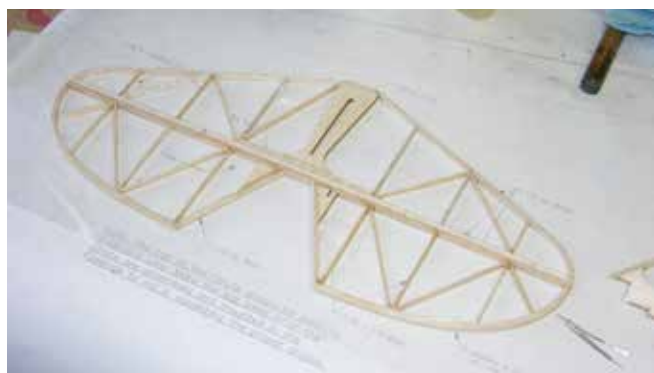
Make up the front and rear cockpit fairings and glue them in place with Pacer Canopy 560 glue. Begin at the rear fairing and work forward. Build the tail fairing block carving jig, tack-glue it in place on the stabilizer saddle, and carve and sand the blocks to final shape. Bend the cabane struts to shape but don't make the top bends until the struts are in place. Solder them together directly over the plans, and then test fit them into the fuselage. Measure the height and make the top bends so that they are perpendicular and parallel. Pin the tail surfaces in place and run in the rudder pull-pull cables and note the exit points on the plans for reference after the fuselage is covered. Build the motor mount assembly and glue it onto the firewall. Install the motor and slip the speed control through the firewall slot and test run the system for proper operation (without the propeller).



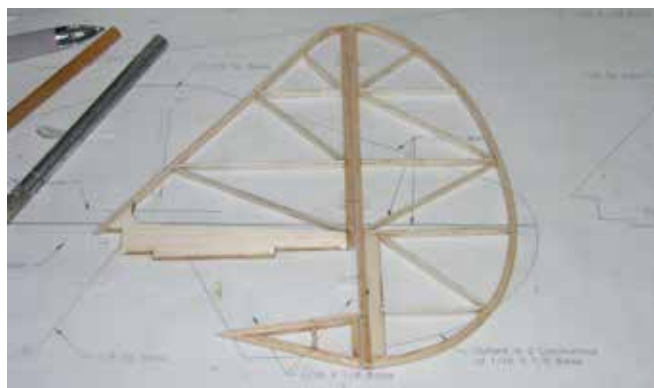
The fuselage is a typical structure with the side frames built flat on the plan's side view and then joined with the cross-pieces. Then the upper formers and the stringers are added.



The cockpit fairings are made with file folder paper glued in place with Formula 560 canopy glue. The templates are shown on the plans.



The horizontal stabilizer and elevators are built flat over the plans.



The rudder and vertical fin are also built flat over the plans.

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The large cockpit opening makes for easy access to the rudder and elevator servos when running in the pushrod and pull/pull cables.



The wing panels are swept. Here is one of the bottom panels with the ailerons built as part of the panel and then later cut free.

### SPECIFICATIONS

**MODEL:** Fly Baby Bipe

**TYPE:** 1/8-scale park flyer biplane

**WINGSPAN:** 33 in.

**LENGTH:** 30 in.

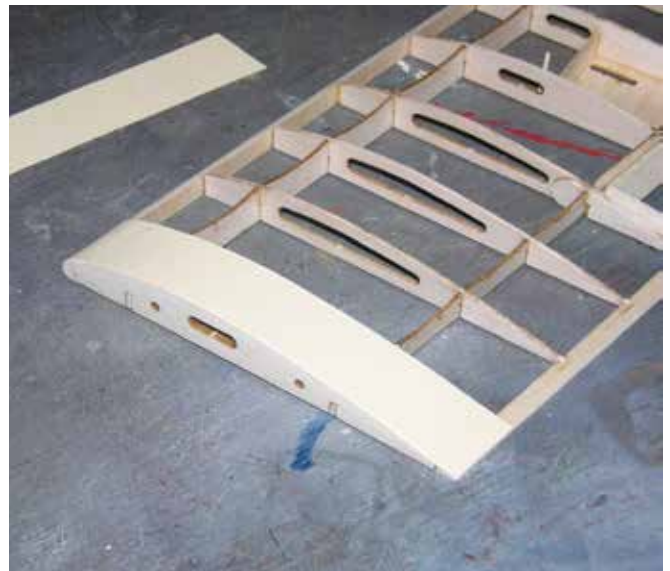
**WING AREA:** 350 sq. in.

**WING LOADING:** 6.13 oz./sq. ft.

**FLYING WEIGHT:** 14.9 oz. (w/ Thunder Power 1320mAh 2S battery)

**POWER:** E-flite 370 brushless outrunner motor

**RADIO:** 4-channel (rudder, aileron, elevator, and throttle)



Here is the root end of one of the bottom panels.



The top wing center section is built up directly over the plans. The trailing edge cutout is laminated from balsa to ensure a smooth transition when covered. The outer wing panels are framed up beginning with the rib and spar assemblies aligned over the plans and glued in place.



Here you see the top wing panels and center section being assembled over the plans.



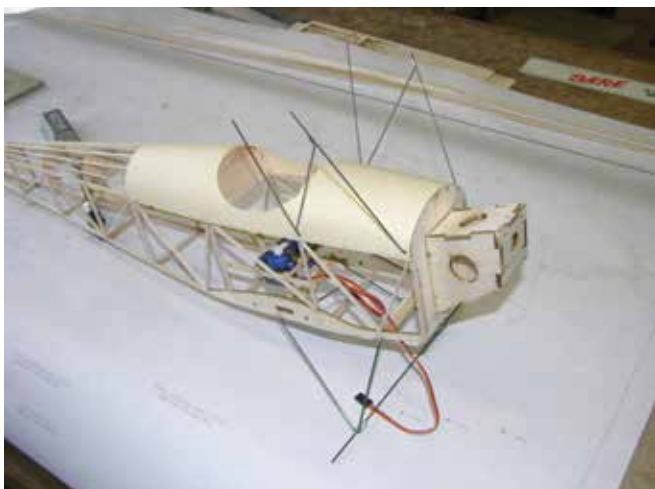
Here you see the aileron hinged into place plus the interplane strut supports and the servo attachment assembly glued in place.

### TOP WING

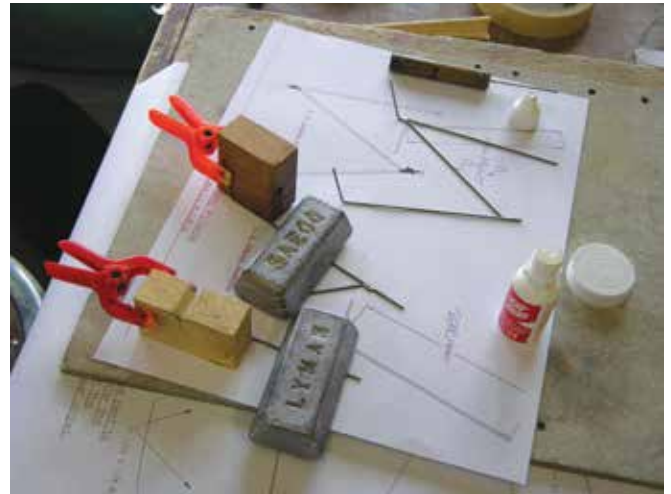
First build the center section trailing edge cutout assembly and pin it over the plans. Pin the strut supports over the plans, then fit the A8 and A9 ribs in place. Align and glue the rib/spar and the trailing edge cutout assembly in place. Align and glue the R6 ribs in place followed by the A15 doublers and the leading edge to complete. Build the outer panels directly over the plan and then assemble the wingtips and glue them to the trailing edge and both spars. Join the outer panels and center section with the outer panels blocked up, then glue the assembly together. Remove the wing from the board and sand the assembly to shape.

### BOTTOM WING

Assemble the wing panels over the plans, adding the leading and trailing edges and the wingtip assemblies. Build the ailerons while the wing panels are still pinned down. When the assemblies are complete, remove the wings from the board and sand to shape. Remove the ailerons and sand them to final shape, and then dry fit the hinges. Add the alignment



Here the cabane struts and landing gear have been attached to the fuselage.



Here the wire interplane struts are being soldered together.

dowels and the paper walkways on the top surface between ribs R1 and R2. Drill the holes for the flying wires and then glue the aileron servos in place with silicone caulk.

### COVERING AND FINISHING

Though the structure is strong, it's just too light to use MonoKote or UltraCote covering. I prefer Coverite MicroLite or Nelson Litefilm. The vacuum-formed cowl and dummy engine are built up and detailed, then fitted onto the fuselage. The basswood cowl mounts are then cut to shape and fitted and glued in place on the firewall. When the model is covered, the Callie Graphics' decal markings can be applied and the cowl can be painted. Step-by-step instructions for building the cowl are at [patscustom-models.com](http://patscustom-models.com).

### FINAL ASSEMBLY

Glue all of the hinges in place and then make the aileron push-rods with a Z-bend at both ends. Align the ailerons to their neutral position and glue the control horns in place. Block up the dihedral on the bottom wings and glue them in place.



Here the airframe has been dry-fit together to check alignment and fit.

## The Original Fly Baby



The original Fly Baby was designed by Peter M. Bowers, and it was first flown in 1962. The all-wood, low wing, open cockpit, homebuilt monoplane was powered by a Continental A-65 engine and the cowl arrangement was from the venerable J-3 Cub. It had a wingspan of 28 feet, with an overall length of 18 feet and 10 inches, had an empty weight of 605 pounds, and a cruise speed of 110mph.

Later, the biplane version appeared, using the same fuselage and tail section as the monoplane, but with the wings shortened and swept back 11 degrees. The biplane had a wingspan of just 22 feet, making for a very compact airplane. The empty weight was a bit heavier at 652 pounds and the biplane was also a good bit slower with a cruise speed of only 80mph. The whole concept was to provide an easy-to-build, easy-to-fly design for the experimental homebuilder. The result was a great-flying and the great-looking little airplane that didn't require a tremendous level of skill to build. It could also be built on a budget and was very easy and economical to fly.



Here the interplane struts have been dry-fit into place.



Formed plastic parts are available from the author, and ordering instructions are on the plans.



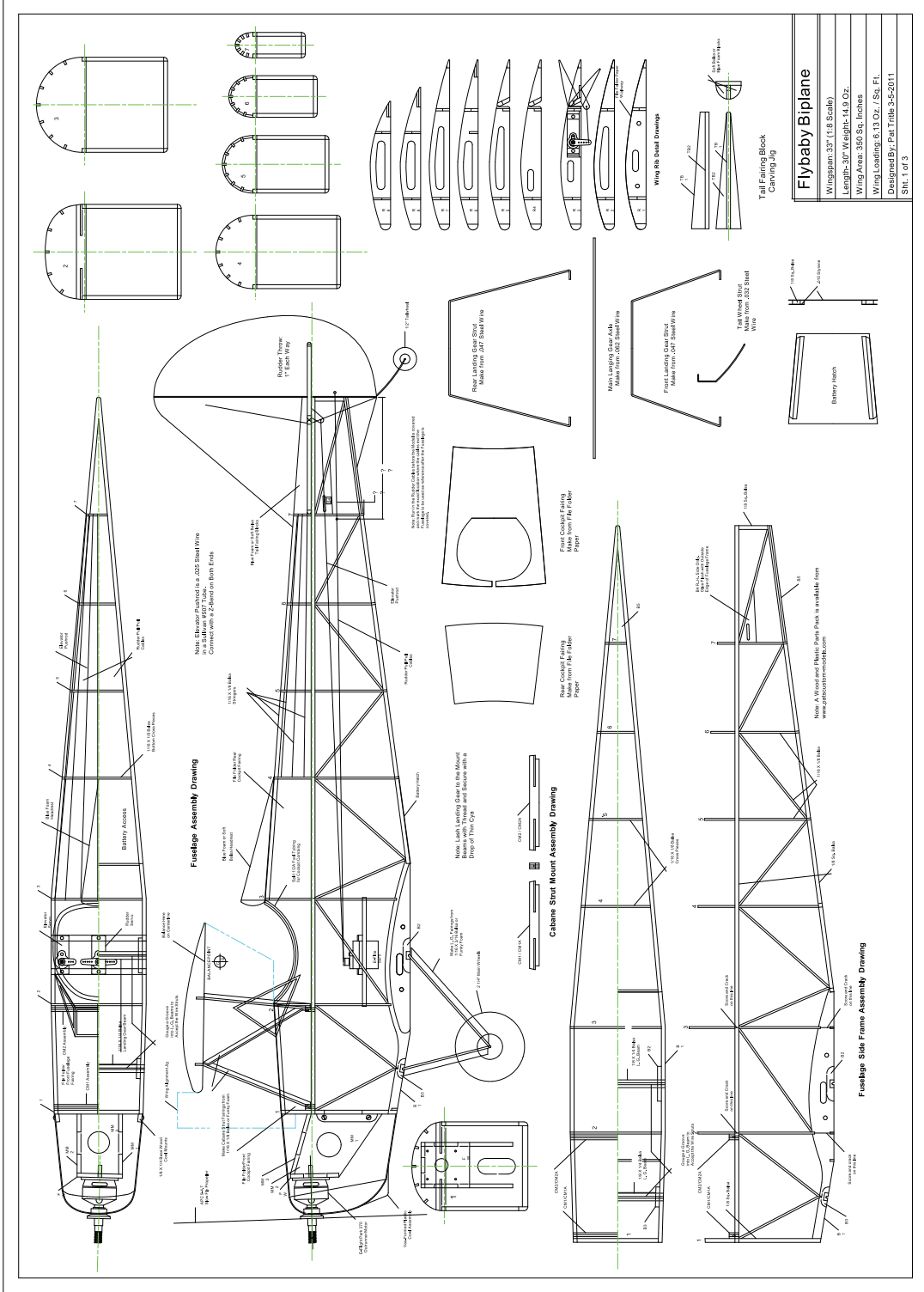
Here the engine cowling and dummy engine cylinders have been added.

Slip the cabane struts into their mounts and pin the alignment jig onto the fuselage center line. Fit the interplane struts into the bottom wing, then fit the top wing onto the cabane and interplane struts. Check the alignment and glue them in place. Use the wings for reference and then align and glue the tail surfaces in place, followed by the fairing blocks and tail brace wires.

Install the elevator pushrod connected with a Z-bend at the servo arm. Make another Z-bend at the hinge line, and then position the elevator at its neutral position and glue the control horn in place. Install the pull-pull cables and tie them off to the

rudder horns.

The flying and landing wires are functional, so don't skip this step. The flying wires run from the front landing gear strut and wing root up to the top of the interplane struts. The landing wires run from the top of the cabane struts down to the bottom of the interplane struts. Once the wires are all in place, pull them taut and secure with some thin CA. Glue the windshield and cockpit combing in place, followed by the cowl and wheels. Set the CG balance using the battery location to your best advantage and the Fly Baby is ready to go!



## X0413A | Fly Baby Bipe

Designed by Pat Tritle, the Fly Baby Bipe is a lightweight, yet strong, park flyer biplane. It features traditional stick and former construction with egg-crate wing structures. The model is a one-piece design with the wings glued and rigged into place to save weight. The compact model easily fits into any car. WS: 33 in.; L: 30 in.; Power: 370 brushless motor; Radio: 4-channel; LD: 2; 3 sheets; \$24.95. To purchase full-size plans, go to [AirAgeStore.com](http://AirAgeStore.com)

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After the frames are covered, the bottom wing is glued in place. The top wing is dry fitted using the alignment jig made from artists foam board to get the wing incidence correct before gluing the wing to the cabane struts.



A hatch in the belly allows easy battery installation.



The cabane struts and the landing gear are faired with strip balsa for a scale appearance.



Here the wing and tail has rigging been added. The Fly Baby Bipe is a one-piece plane so there is no field assembly before flight. It is compact enough to fit fully assembled in most compact cars.

### FLYING THE FLY BABY

Though the model is a very docile flyer, I added 70% dual rates to the controls. The Fly Baby is not a floater. Ground handling is excellent, in spite of its narrow landing gear. In the air, the model grooves nicely and responds well with very little adverse yaw under normal conditions. Very little rudder input is needed. The model loops and rolls well, and does a good stall turn. As one would expect, rolls are not particularly axial. You'll need to dive for airspeed to make it over the top of the loop. The vertical lines into stall turns are maybe four or five fuselage lengths. The model will stall but, easing into slow flight with a bit of power, she'll get really slow before the break. The stall break is rather abrupt, but as soon as the controls are released, she'll immediately begin to fly again. It won't snap or "turn turtle" unless you really push it.

The best part of the Fly Baby is the way she lands. Fly the approach with a little power and the nose down a bit to maintain speed. Ease the nose up to bleed off the last of the airspeed and let the model settle into ground effect a bit before it touches down. In all, the Fly Baby is as easy to build as any biplane you'll find, and flies great. The model grooves nicely, and performs exactly as one would expect from this terrific little homebuilt biplane. ✚



The Fly Baby Bipe ready for its first flight.