

Instruction Manual for the PteroWorks Super Guppy

Thank you for purchasing this Super Guppy kit. It can be built in just a few days, or a few weekends. If you have built and covered a wood model before you should have no trouble here, but please read the instructions thoroughly. Take your time, be careful and have fun with the build. You will need thin and medium CA glue, 15 minute epoxy or aliphatic wood glue, and sandpaper to assemble the airframe, and small spring clamps or clothespins will also be helpful. This manual can be downloaded from the website (PteroWorks.com) as a PDF, and the pictures enlarged on your computer for greater clarity.

The Super Guppy is easy to fly with the control surfaces at low rates - it is very docile, but it is not a high-wing trainer and requires some flying experience. At high rates the Super Guppy is capable of most 3D maneuvers. The wing loading is low, and if set up properly there should be no surprises while flying.

Specs:

- wingspan: 45"
- length: 34"
- wing area: 370 square inches (2.57 ft²)
- weight RTF: 20-23 oz. (with a 3s 1800 mah LiPoly battery)
- wing loading: 8.5 oz/ft²

Included in this kit:

13 sheets of laser cut wood (all wood required), 60" x 36" rolled plans, all carbon wing spars, carbon pushrods, wing joiners, instructions.

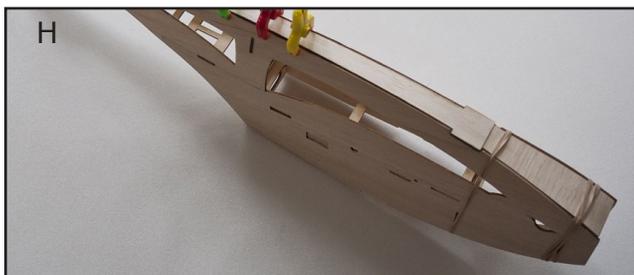
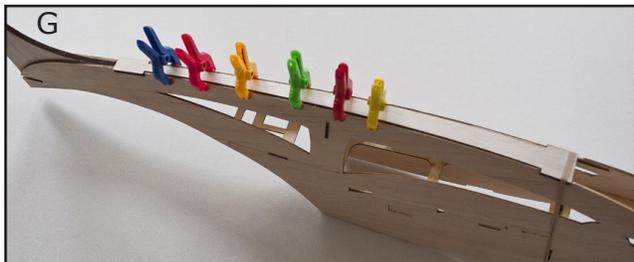
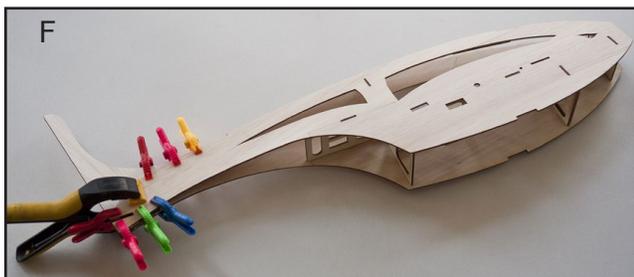
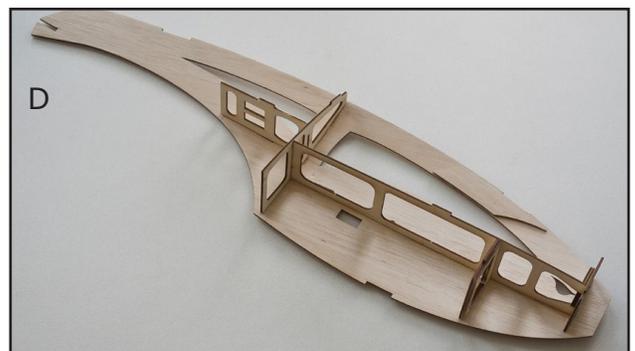
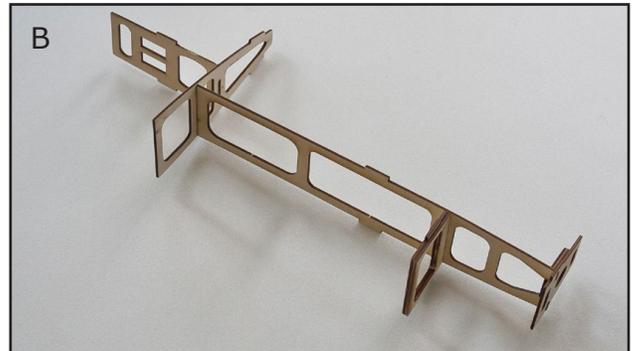
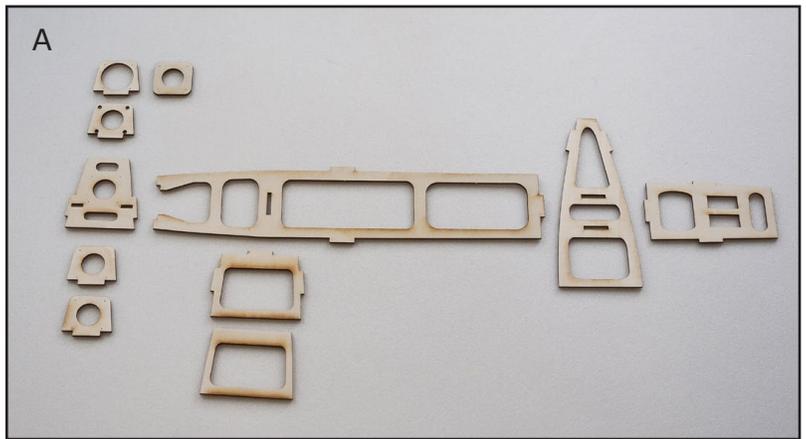
Additional gear required: 29 mm 200 watt brushless motor with a kVa of around 900-1,000 rpm/v (AXI 2212-26 or Eflight 450-890), 10 x 6 prop, 20 A ESC, four mini servos (HS-65HB or equal), 6 channel receiver, 1200-2000 mah 3s LiPoly battery, 3" lightweight wheel (optional).

Requires covering material (Ultracote or Oracover Lite recommended).

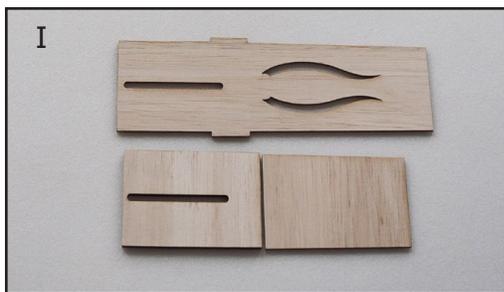


Body

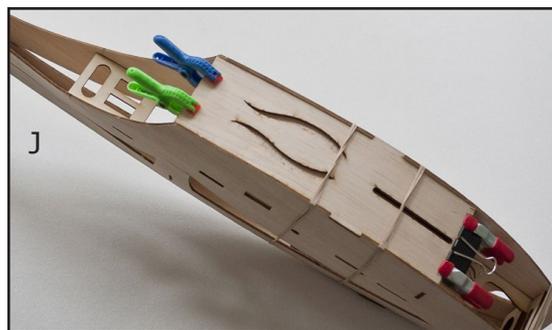
1. Collect all parts for the inner frame (fig. A).
2. Assemble and glue inner frame skeleton out of six ply pieces. Add motor mount doubler pieces as required for your motor. Check fit of tabs and sand if necessary before gluing (fig. B).
3. Glue two pieces of left and right body halves together. Glue doubler in place at top joint. Note position of doubler does not cover notch at top of body (fig. C).
4. Check fit of inner frame to left body half and glue in place (fig. D).
5. Check fit of right body side and glue in place (fig. E).
6. Check fit then glue rudder post to rear body sides. Note rudder post is sandwiched in-between body sides. Be sure body is square and straight before gluing. Small clamps can help to set alignment before gluing, and a scrap of 1/8" balsa can be used to align stabilizer slots. Use slow setting glue (fig. F).
7. Slide "backbone" into open top of body, check fit, sand if necessary and glue in place. Small clamps can help ensure a solid bond (fig. G).
8. Check fit then glue top head piece. Sand if necessary for a good fit (fig. H).



9. Glue two belly plate doublers to the inside of belly plate (fig. I).



10. Check fit then glue belly plate to bottom of body assembly (fig. J).

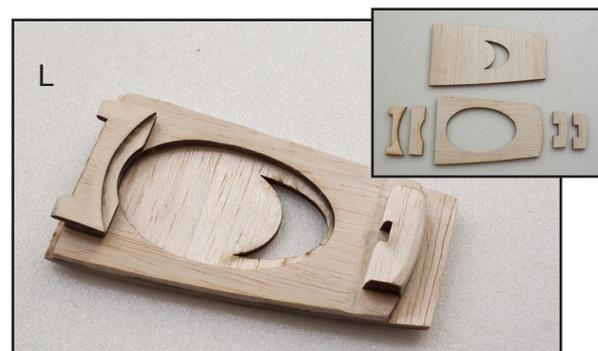


11. Check fit then glue lower tail sheeting to bottom of body (fig. K).



12. Assemble lower battery hatch parts, checking position and fit of latch pieces before gluing (fig. L, see also J on page 7).

13. Sand body until pretty!



Wing

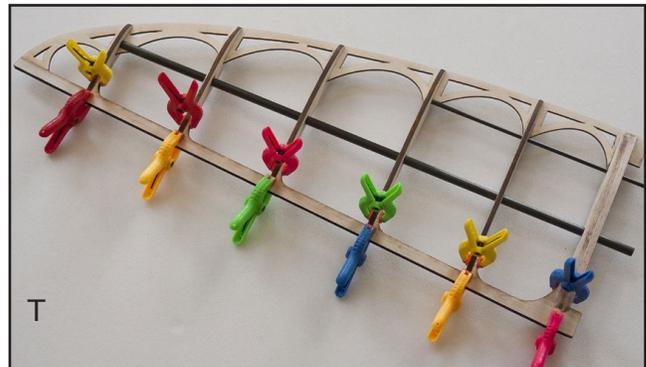
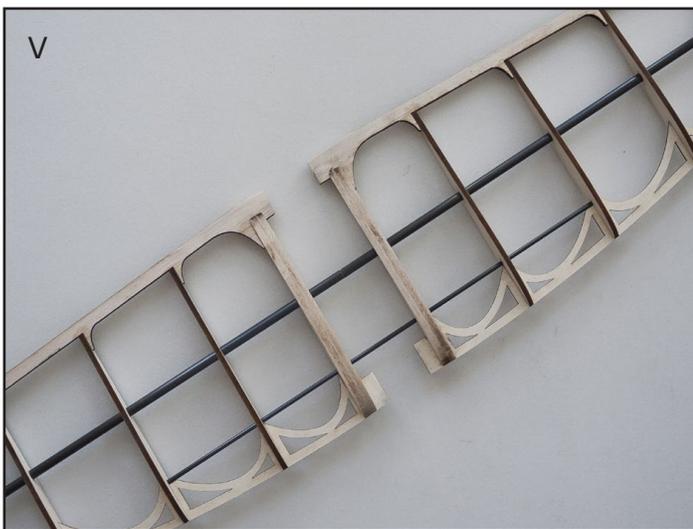
14. Cut two sets of carbon wing spars to length (0.156" x 8 7/16") and (0.312" x 19 5/8").

15. Collect all wing parts and lightly sand any laser burn off all parts (fig. M).

16. Glue two sets of identical inner (root) ribs (the 1/4" balsa ones) together, and sand an angle into inner side surface (where it will mate with the body) to match body angle. Note orientation of ribs - the extension tab at the trailing edge is on the **bottom** of the wing. Test fit the rib assembly to the body with a carbon wing spar (fig. N, O, P).



17. Fit all ribs to the leading edge piece. Do not glue yet (fig. Q).
18. Carefully run carbon wing spars through holes in ribs and into notches on leading edge piece. Do not glue yet (fig. R, S).
19. Fit and glue trailing edge pieces to rib ends and the leading edge piece at the tip (fig. T).
20. Note wings will be joined during final assembly with joiners (steel and carbon) for both carbon spars (fig. U).
21. Place wing assemblies on a flat surface and ensure there is no twist or warp in wing and glue all joints. Note: wing design will favor a slight amount of wash-out at the wing tips to increase stability of wing. Note again orientation of ribs - the extension tab at the trailing edge is on the **bottom** of the wing (fig. V).
22. Carefully sand trailing edge to match the profile of the ribs, and sand ailerons to match wing ribs and taper down toward their trailing edges (fig. W).

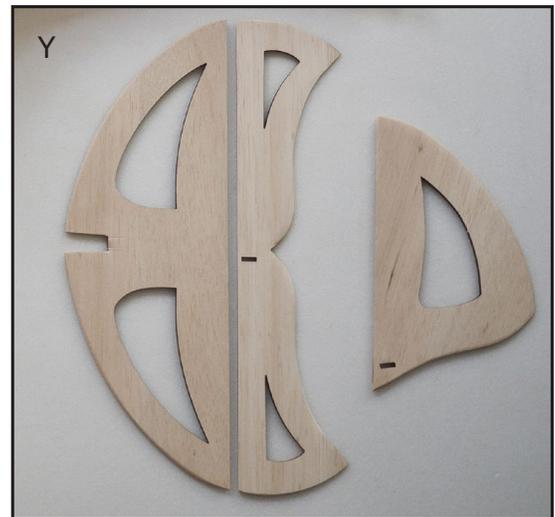


Tail

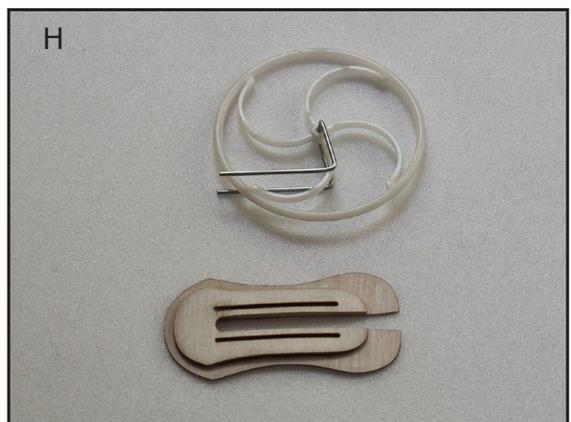
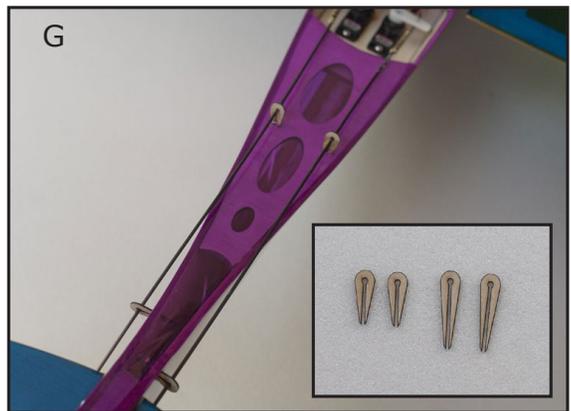
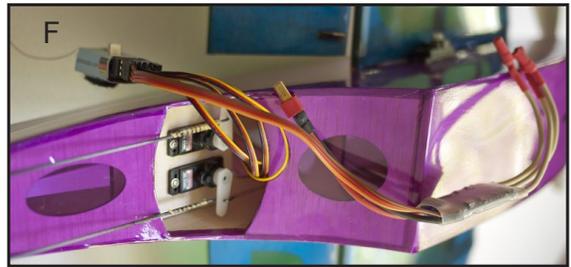
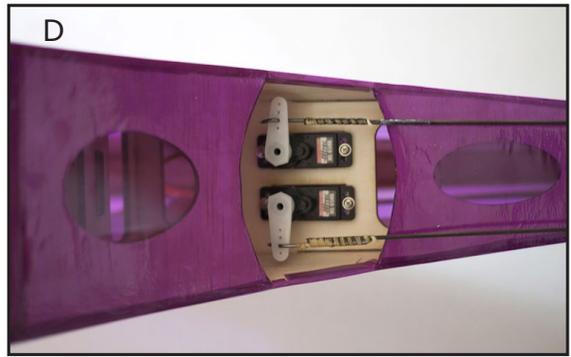
23. Carefully sand rudder and horizontal stabilizer/elevator pieces for a nice aerodynamic shape. Do not glue in control horns yet (fig. Y). **Note: shorter control horns are meant for the tail surfaces (elevator and rudder).**

Covering and Assembly

24. Cover all parts before final assembly. Ultracote/Oracover Lite is recommended, but any good lightweight covering will work. When covering the wing halves ensure there is no twist or warp. Use a heat gun or covering iron to carefully remove any twist or warp after covering (figs. Z, A).
25. Glue wing joiners half-way into carbon spars of a wing half (2" x .125 steel joiner into front spar and 4" x .230" into main spar) (fig. B).
26. Tape the control surfaces (ailerons, rudder and elevator) to the wing halves and stabilizers with 1/2" clear tape. Glue control horns into slots. Aileron horns should be on bottom side and elevator horn should be on top. Rudder horn should be on side opposite elevator horn. Use short horns for elevator/rudder.
27. Check fit then glue the horizontal stab into the body slot using slow set glue, ensuring it is square to the vertical rudder and wing. Sand if necessary to ensure a good fit (fig. C).



28. Install the motor, ensuring there is clearance with the body sides and lower battery hatch. Wires should run through the vent hole in the firewall, and speed control will need to be attached to wires on inside of body.
29. Install the elevator and rudder servos into the rear of the body, and aileron servos into rectangle holes in body. Note orientation in picture. Glue in place with CA or use screws (figs. D, E).
30. The wing can be left un-glued if you wish them to be removable, but for increased strength the wing joiners should be glued together.
31. Install receiver and speed control (ESC) through tail servo area above wing and test fit the battery, which should lay on the belly plate doubler. Use a 3S LiPoly 1400 - 2000 mah (fig. F).
32. Attach control rods to servo horns and control surfaces. Use Z-bend .050" piano wire for ailerons and .050" carbon rods with .050" piano wire glued to each end. Use control rod locators for the rudder and elevator (fig. G).
33. If you want a wheel (3" wheel not supplied), assemble ply wheel mount and bend .062" wire as shown. Paint or cover first, then epoxy wire into slots in ply. Glue assembly to belly of body as shown (figs. H, I).
34. Check fit of battery hatch and note tabs to hold rear of hatch in place. Use a magnet (not supplied) to hold the front of the hatch in place (fig. J).



35. Check Center of Gravity against the plans (3/4" - 7/8" in front of the center of the main spar) and ensure you are within 1/8". Position the battery to adjust the C/G, and mark the battery's position. Use velcro to hold the battery in place.
36. Program radio and adjust control surface throws. High rates: Elevator should be about 5/8" up and down; ailerons should be 3/4" up and 3/4" down. Rudder throw should be about 1" left and right. Low rates should be 60%-70% of high rates. Exponential is recommended.

Flying

37. Double check that the wing is free of warp by sighting down the airframe from the tail. Warp can be removed by careful application of a heat gun or iron on the covering material. Also check the position and direction of travel of all control surfaces.
38. Always perform a radio check before flying the Super Guppy. **Use low rates for first flight!** The Super Guppy is designed to take off with a gentle toss of your hand or from a smooth surface if you have a wheel. Flight should be predictable and responsive. Spoilerons (raised ailerons) can be programmed for shorter landings but are not required. Experiment at a safe height!

Have fun!

