

SLOW STICK



Wing span: Approx. 42"
Wing Area: 504 sq. in.
Wing Loading: 6.71 oz/sq. ft.

Assembly Instructions

The Slow Stick X PARF (Partial ARF) is an upgrade to the GWS Slow Stick Electric ARF Park Flyer Airplane Kit™. This PARF kit replaces the original Styrofoam wing and tail surfaces of the Slow Stick to a more robust balsa-constructed design, complete with ailerons and a full symmetrical wing, allowing the Slow Stick to become a fully aerobatic model aircraft. The Slow Stick X ARF does not require parts from an existing Slow Stick.

Adult supervision recommended for children 15 and under. R/C Airplanes should be flown following safety guidelines provided by the AMA (Academy of Model Aeronautics).

CAUTION: This is not a toy!

Recommendations:

1. Read through each step before starting assembly.
2. After removing all the pieces from packaging, inspect to make sure there are no broken or missing parts.
3. **CAUTION:** When removing masking tape from covered parts, always do so by pulling tape onto itself, rather than straight off, in order to prevent damage to covering.
4. Check off each completed step to help keep from losing your place.

List of Provided PARF Kit Parts:

1. Covered balsa wing and tail surfaces (ailerons, elevators, rudders. . .)
2. Slow Stick X Decal
3. CA hinges for ailerons (depends on version of kit)
4. Aileron push rods and links
5. Tail mount
6. #33 Rubber bands
7. Rubber band post extenders
8. Velcro strap to mount battery
9. Foam Tape
10. 2 #2 3/8 sheet metal screws
11. 2 #2 washers
12. Velcro Tape
13. Instruction Manual
14. Push rods for elevator and rudder
15. 6 #1 3/8 sheet metal screws
16. 2 # 2 1/4 sheet metal screws (optional for motor mount)
17. 4 control horns
18. Tail skid

List of Additionally Provided ARF Kit Parts:

1. Plastic parts tree
2. Carbon fiber fuselage
3. X-Gear Landing Gear Kit
4. 2 1/2" Ultra-Light Wheels

Additional Items Required:

1. GWS Slow Stick Electric ARF Park Flyer Airplane Kit™ (used or new) or Millennium R/C Fuselage Kit (Applies to PARF model only)
2. All tools, equipment and materials recommended in Slow Stick Assembly Instruction Manual or our fuselage kit
3. Cyanoacrylate or CA Glue (thin and thick)
4. Hobby knife, diagonal cutters and pliers
5. Rotary Tool, 1/16" bit and #56 drill
6. Micro screwdriver set
7. Metal File
8. Hinge tape (recommend 3M Scotch™ 3/4" Transparent Tape)
9. T-pins
10. Tape measure, and/or yardstick, and square
11. Three or four micro servos
12. Motor and speed control (recommend E-flight 400-480 or equivalent with appropriate speed control)
13. Battery (recommend Thunderpower 3-cell 1320 or equivalent)
14. Propeller (use what is recommended in instructions for motor)

These directions cover both PARF & ARF Kits.
Assemble using the steps for the relevant kit.

**IMPORTANT : DO NOT GLUE
UNTIL INSTRUCTED TO DO SO**

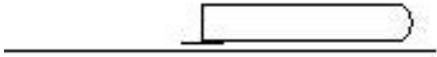
DISCLAIMER:

Millennium R/C assumes no responsibility for any accident or injury to persons or damage to property.

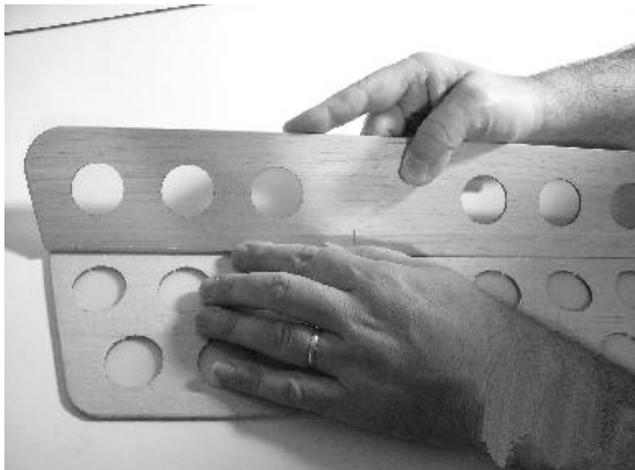
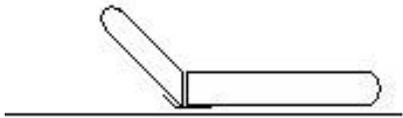
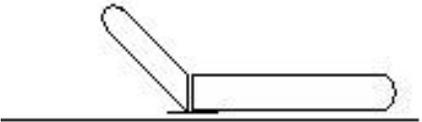
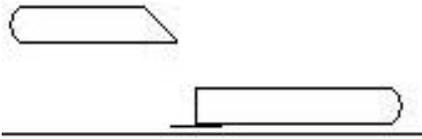
Refer to our website for updates on instructions
www.millenniumrc.com

Assembly of the control hinges

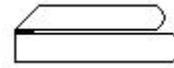
1. Start by removing the horizontal stabilizer and vertical stabilizer from the packing bags. Remove the four pieces of masking tape holding the elevator to the stabilizer.
2. Tape a length of Scotch tape™ along the rear trailing edge of the horizontal stabilizer and secure with your finger (either side is fine). Now, flip the stabilizer and place on a work surface. See diagram below:



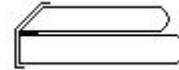
3. Now, take the elevator. You will see that the elevator has a 'beveled' edge. This is important in creating the hinge. Ensure that the beveled edge is pointing up, and while holding at a 45° angle, place up the trailing edge of the horizontal stabilizer and secure the hinge tape to the elevator with your finger. See diagrams below:



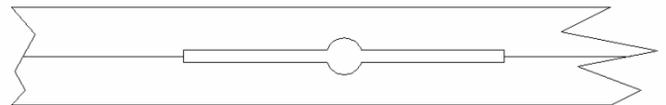
4. Turn the stabilizer assembly over, and carefully fold the elevator back onto the stabilizer.



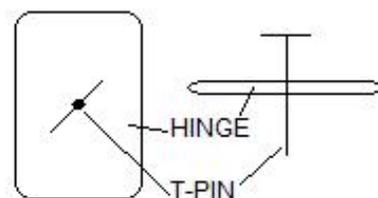
5. Tape another length of Scotch tape™ along the bottom hinge line and secure with your finger.



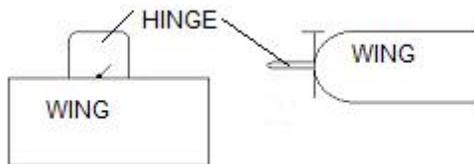
6. Fold the elevator back to normal position. Test the hinge by pulling gently on the control surface. Cut off any excess tape overhanging the stabilizer sides.
7. Repeat the steps 1. thru 7. for the rudder.
8. Remove the wing from the packing bag. Remove the four pieces of masking tape securing each aileron to the wing.
9. The hinges holding the ailerons to the wing are of CA type. Remove the ailerons from the wing. Now, remove all the hinges from the wing/ailerons.
10. Locate the hinge slots on the ailerons/wing. In order to ensure that the CA adhesive penetrates the wood, take a micro drill bit and drill a small hole into the hinge slot. See image below:



11. Remove the small lengths of string going through the center of each hinge. Now, take a T-pin and push through the center of each hinge (where the string was once situated).



- Slide the hinge, complete with centered T-pin into the wing hinge slots from which you previously removed the hinge.

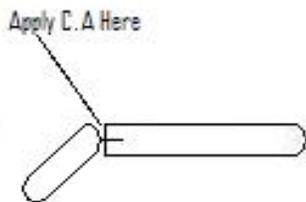


- Push the aileron back onto the hinges installed in the wing. The T-pins will stop the hinges pushing into the wing, and ensure they are centered.



- Remove the T-pins from the installed hinges.

- Bend the aileron at a 45° angle. Using thin CA glue and a capillary tube, place a small amount onto the hinge. The glue will soak into the balsa of the wing and the aileron.



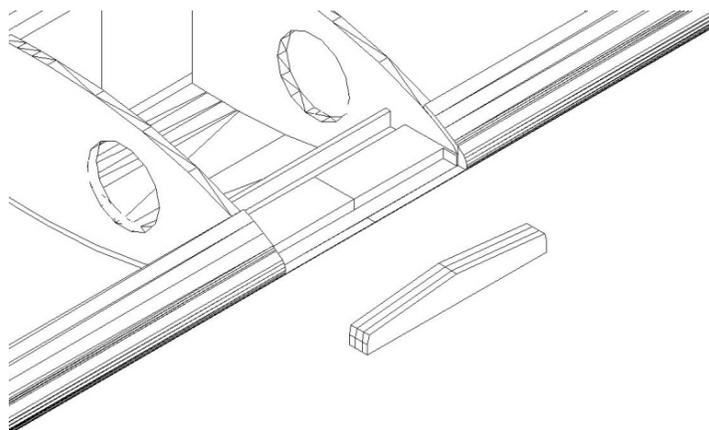
- Using thin CA and a capillary tube, place a small amount of CA glue into the holes drilled in step #13.

- Turn the wing assembly over and repeat step #15 & 16. Check the hinges by gently pulling on the control surface.

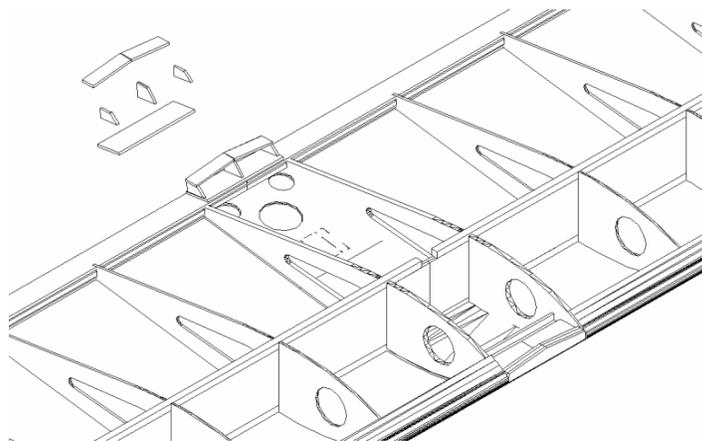
Assembly of the wing hardware & servo installation

- Open the bag containing the plywood pieces carefully. The hardware bag contains many small items that can get misplaced easily. First, locate the 4 identical plywood pieces used for the front wing saddle. Using thick CA glue, glue all 4 pieces together. Using thick CA, glue onto the bottom of the

leading edge of wing between the center ribs, making sure to trim any excess covering that may prevent it from gluing properly.



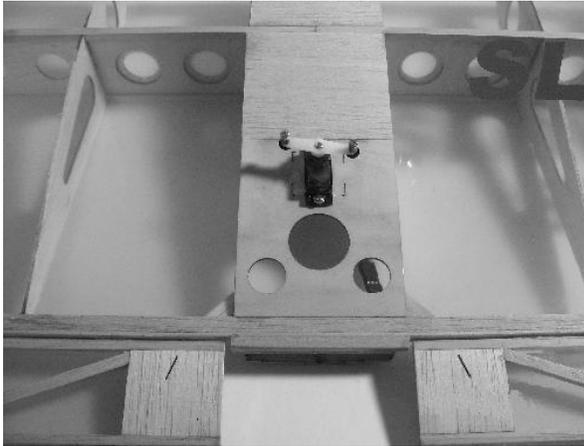
- Locate the small plywood parts for the rear wing saddle, and assemble using thick CA glue as shown in the diagram below. Using thick CA, glue onto the bottom trailing edge of wing, between the center ribs, making sure to trim any excess covering that may prevent it from gluing properly. Measure to be certain it is centered properly. TIP: Do not use excessive amount of glue, as this piece should be able to break off in a crash, possibly preventing heavy damage to the wing.



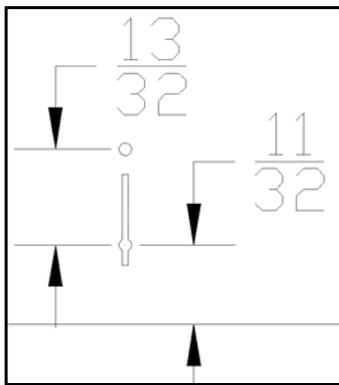
- Flip the wing over so top is up. Cut out hole for servo in center of wing. Using a sharp hobby knife or razor, cut through the covering and score the break-a-way on both sides until the square comes out easily.

- Install the servo, adjusting the size of the opening as needed, with a hobby knife. Drill

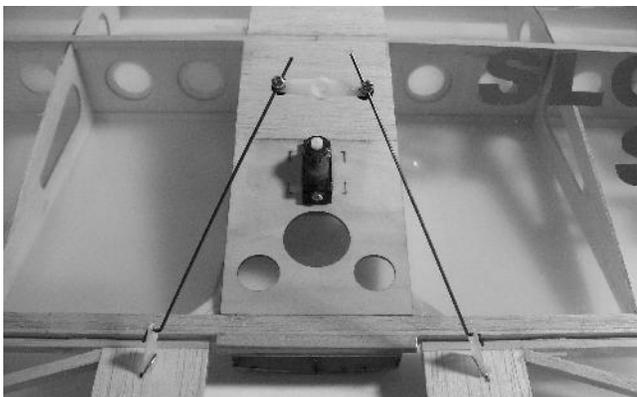
tiny holes through servo mounts and mount the servo using servo-manufacturer provided screws.



22. Drill two 1/16 holes for all 4 control horns. Glue the control horns into the holes using thick CA glue.

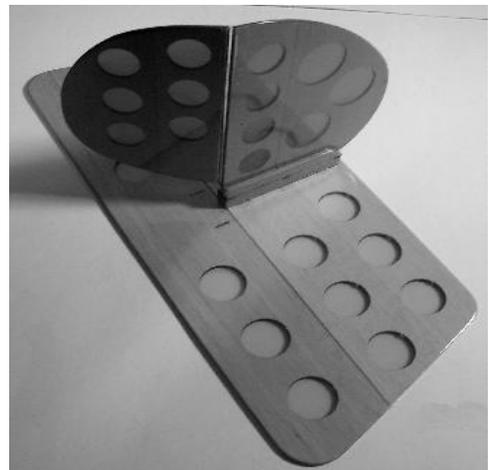
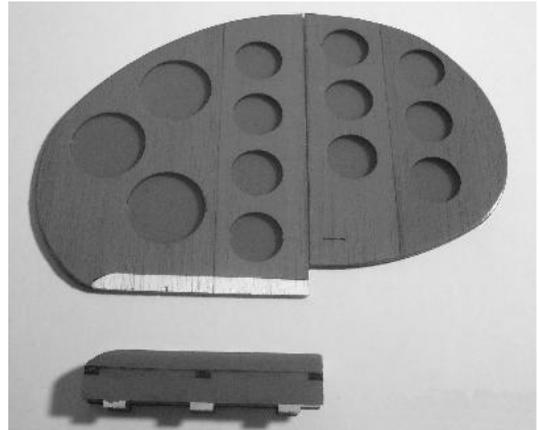


23. Insert the Z-bend end of the aileron push rod into the control horn. With the servo control arm disconnected from the servo, slide the two aileron control rods into the two EZ links. Line up the ailerons so that they are in neutral position, then tighten the screws on the EZ links. Cut excess wire. **Wing is complete!**

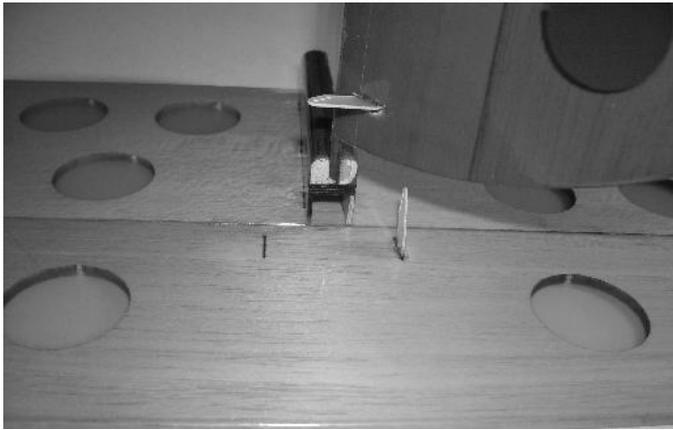


Assembly of the Tail Section

24. Cut away covering from slots on the vertical and horizontal stabilizer for mounting the tail section mount. Line the tail section mount with the bottom edge of the vertical stabilizer and trace the edge with a marker. **It is important to note that the sloped side of the tail section mount should point forwards, towards the front of the airplane.** Cut the plastic covering just inside this area so that the balsa wood there will glue on better. Be careful not to cut into the balsa. Test-fit the two pieces. They should fit snugly.

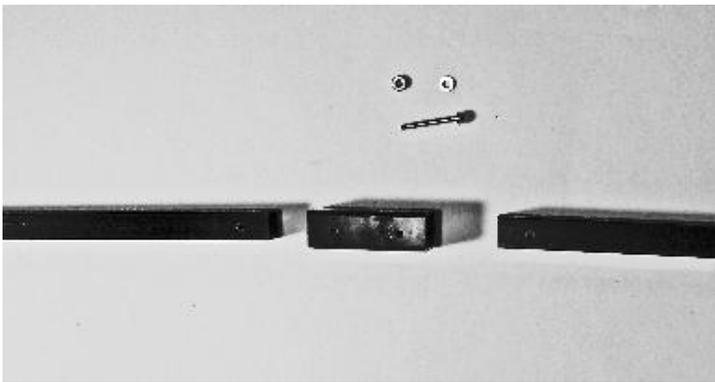


25. Attach the tail mount to the horizontal stabilizer and glue the vertical stabilizer in place using thin CA glue, being careful to check they are square.
26. Choose which side of the rudder and elevator you want to put the control horn on (either works fine). Insert control horn into pre-cut slots in opposite sides of rudder and elevator, using thin CA glue to secure. NOTE: GWS control horns also work in these slots.

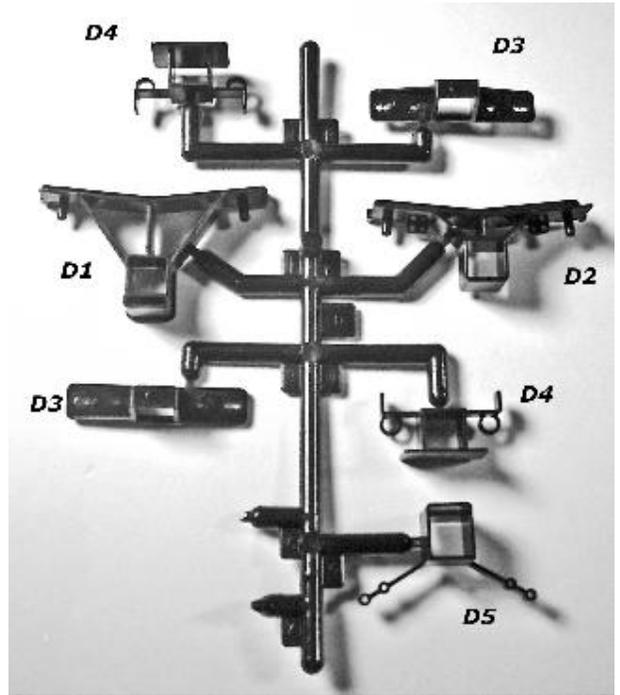


Fuselage Assembly

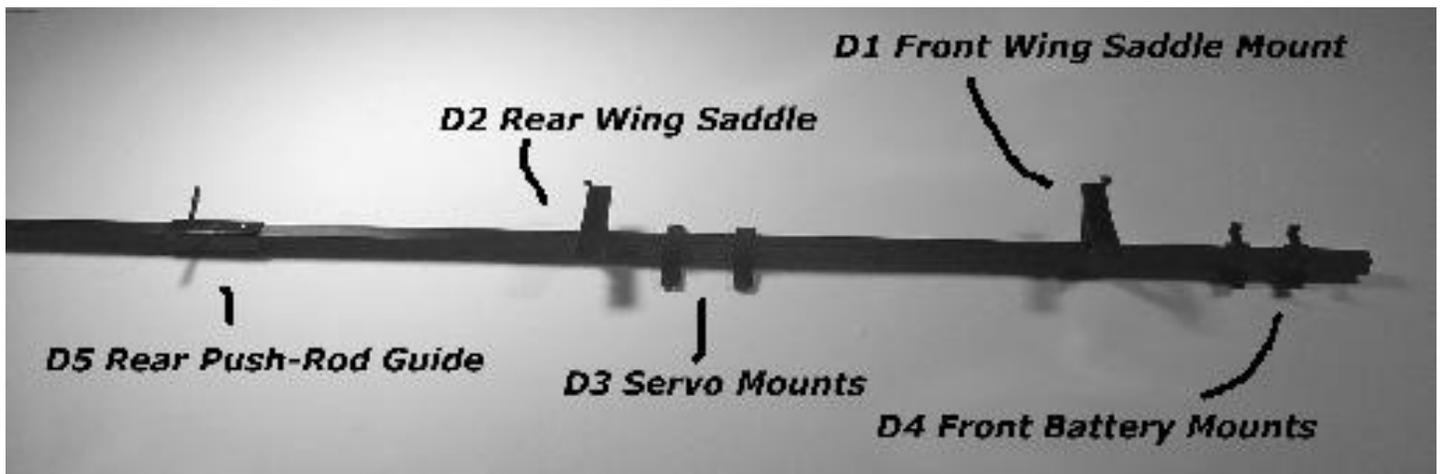
27. (Only applies to 2-piece fuselage) Use CA glue to attach fuselage joiner to one end of the shorter fuselage stick (tail end).
28. (Only applies to 2-piece fuselage) Slide one end of the longer fuselage stick into the joiner and attach with provided screw. Cut excess off end of screw and file down sharp edges. See image below:



29. Familiarize yourself with the included (ARF ONLY) plastic parts tree. Those with the PARF kit, use the existing GWS parts from your GWS Slow Stick™

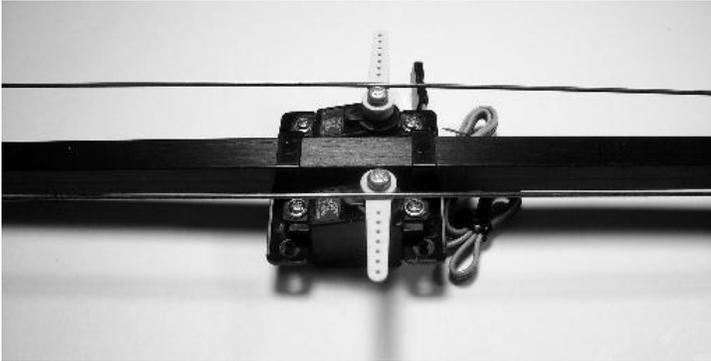


30. Using a hobby knife or diagonal cutters, remove parts from black plastic tree "D". Slide part #D5 (push rod guide) onto the tail end of the fuselage. Then slide part #D2 (rear wing saddle mount) onto the front end of the fuselage, approximately 15 1/2" down the stick. DO NOT SCREW IN YET.
31. Slide the two part #D3's (servo mounts) down about an inch from the rear wing saddle mount. Now slide the front wing saddle mount, part #D1 approximately 5 1/2" down from the front.
32. Slide the two battery mounts, parts D4, onto the fuselage, approximately 3" and 1 1/2" from the front. DO NOT glue or screw in any of these plastic parts yet, as they are in temporary positions. See diagram below:



33. Feed the long wire push rod through the push rod guide and through the guide holes in the rear wing saddle, so that the "Z-bend" is at the tail section. Repeat on both sides.

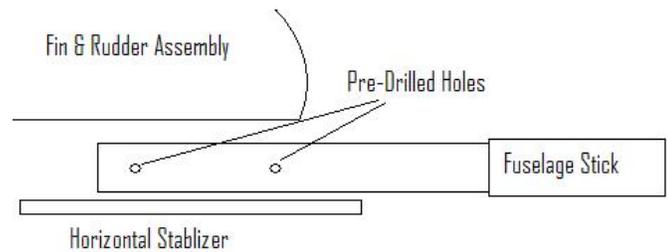
34. Install the servos, as per servo manufacturer instructions, using servo manufacturer-provided hardware. **DO NOT SCREW** any of the parts in yet. See picture below:



Final Assembly

35. Attach the "Z-bend" end of the long control rods into the middle hole of each one of the tail section control horns. Feed the control rods through the rod guides on the fuselage and then slide the tail section on to the fuselage. See diagram below:

NOTE! THE FUSELAGE TAIL SECTION COMES WITH HOLES PREDILLED! ALIGN THESE HOLES AT 90° TO THE TAIL PLANE, AS THESE ARE NOT USED IN CONSTRUCTION.



36. Drill two small holes on the bottom center of the horizontal stabilizer. Use the #2 3/8 screws to fasten the fuselage to the tail assembly. Holes should be about 1/2" from leading edge of the horizontal stabilizer and 1 1/4" from the trailing edge of the horizontal stabilizer. Do not damage the wood when tightening.



Balancing & final fuselage assembly

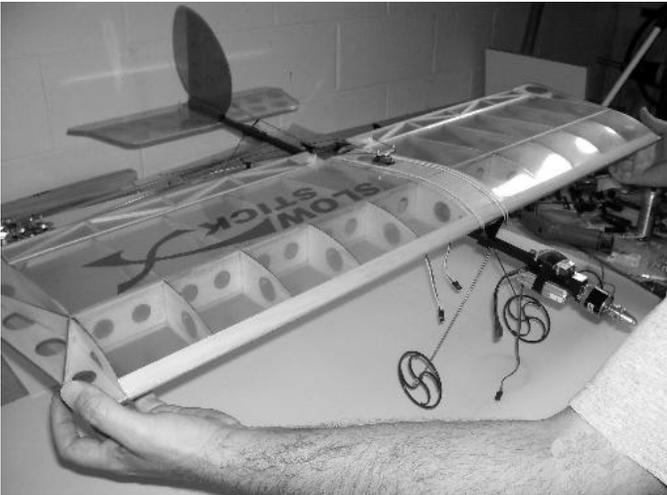
In order to balance this model, a 'dry' assembly of the fuselage is performed. The model is then balanced and finally secured with C.A glue. Follow the steps below to balance the model and finish assembly.

37. Temporarily mount motor, radio gear, battery and other hardware as per manufacturer instructions to prepare the plane to be balanced. If using X-Gear, tape them into place temporarily do not mount landing gear until told to do so. (Front wing saddle needs to be movable during balancing procedure) Attach speed control to top of front battery mounts, using rubber bands.

38. Start out with the front wing saddle approximately 5 inches from the front of the fuselage stick. Attach wing to wing saddle with rubber bands. (three on each side and then two across diagonally). **AFTER THE WING HAS BEEN SECURED WITH BANDS, CHECK THE ALIGNMENT OF THE HORIZONTAL STABILIZER TO THE MAIN WING. THIS IS VERY**

IMPORTANT IN THE FINAL FLYING RESULT OF THIS AIRPLANE.

39. Attach battery and speed control with provided Velcro strap to the front most end of the fuselage.
40. Adjust components as you attempt to balance plane without moving wing back first. Wing should be within 5 to 6" from the front of the stick. Hold plane at wing's spar to balance. Balance point can be pushed back as desired.



41. **Once balanced, without moving any of the black parts, VERY CAREFULLY remove the wing.**
42. Drill a small hole with a #56 drill into the rear wing saddle. Use one of the screws from the fuselage kit to permanently mount to the fuselage stick.

NOTE: If using X-Gear, may attach after plane is balanced, following instructions in kit. Then double-check balance.

43. Attach rudder and elevator linkage to the servos.
44. *Installing Rubber Band Post Extenders:* One minor design flaw in the original Slow Stick is that the rubber band posts are too short. Using 5/32 aluminum tubing, cut 4 3/8" long pieces. (Some kits may come with these already cut). Use thick CA glue and glue them to the existing rubber band posts of the original Slow Stick wing saddles. Make sure you do not leave sharp edges that can cut the rubber bands. I like to fill the

tube with thick CA and leave a bead at the top of the tube. If you do not have a tubing cutter, you can use an Exacto knife in a rolling action to cut the tubing.

45. **Re-attach wing to airplane and set control throws to maximum.**

Main Wing Decal

1. Cut excess material from decal before removing the backing.
2. Remove the protective backing to expose the adhesive.
3. Add about 3 drops of dish soap to 2 pints of clean water. Put it in a spray bottle and spray the back of the decal.
4. Slide the decal into position and squeegee the excess water from under the decal.
5. Allow the decal to dry overnight.

Enjoy Your New Millennium R/C Slow Stick X!



Contact Details

If you need to contact Millennium R/C regarding damaged or missing parts, or have any questions about assembly, please contact us at the following address.

Millennium R/C,
12859 Lower River Blvd, Orlando, FL, 32828
Phone : 1-407-208-9745 / Fax : 1-866-799-2372
E-mail : Service@millenniumrc.com