

MODEL AIRPLANE ENGINEERING
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<http://www.M-A-E.com/Manuals/S3DM.pdf>



Slick 3D Micro

Aerobatic Park Flyer

Instruction Manual

SPECIFICATIONS

Wing Span:	17.55"		
Wing Area:	85.4 sq in	Wing Loading:	1.84 ounce/sq. ft.
Length:	18.5"		
Weight:	31 Grams with 130-1S Lipo & Landing Gear		
Motor:	ParkZone Brushed or 5g Brushless Outrunner		
Servo:	1.5g—1.7g ParkZone or equivalent (1 required)		
ESC:	Built-in (brushed) or XP-3A (brushless)		
Receiver:	PZ: AR6400 or AR6400L		
Battery:	120-1S to 240-1S Lipo, 15C or greater		

INTRODUCTION

Slick 3D Micro will do amazing 3D and sport aerobatic indoors! Huge control surfaces + Huge throws = WILD! But...reduce the control throws and she becomes a pussy cat. *Slick 3D Micro* can also be flown outdoors in a light breeze.

Slick 3D Micro has been engineered for strength, lightness, and great flying fun. The plane assembles very quickly using non-toxic glue.

Radio equipment should be the lightest available. *Slick 3D Micro* was designed specifically for the ParkZone Bind-N-Fly (BNF) 2.4Ghz micro radio equipment.

WHAT YOU WILL NEED

- Glue: UHU Creativ (same as GWS glue), RC-56 Canopy Glue, Craft glue, or Foam-compatible CA
- #11 X-Acto Knife or equivalent
- High-quality packing, clear cellophane, or Blenderm tape for hinge reinforcement
- 4-channel radio with DSM2 2.4Ghz technology
- (1) 1.5 gram or 1.7 gram ultra-micro servo
- XP-3A ESC - if using a brushless motor
- AR6400 or AR6400L ParkZone brick ultra-micro receiver
- 4-Site, P-51, Sukhoi motor/gearbox or brushless outrunner
- Propeller GWS 5x3 HD and 1.5mm prop saver
- Battery: 120-1S to 240-1S Lipoly, 15C minimum
- Charger - LiPoly capable of charging 1S, or use an adapter for 1S with conventional lipo charger

KIT CONTENTS

- 1 ea Assembly Manual (you are here)
- 1 ea 3mm Depron-Aero Fuselage Top w/Rudder
- 1 ea 3mm Depron-Aero Fuselage Bottom
- 1 ea 3mm Depron-Aero Wing w/Ailerons
- 2 ea 3mm Depron-Aero Air Brakes
- 1 ea 3mm Depron-Aero Stab w/Elevator
- 1 ea 2.5mm Square x 14 in. CF Tube for Fuse backbone
- 1 ea 0.8mm x 11 in. CF Rod Wing Struts (1-piece strut, do not cut)
- 1 ea 0.8mm x 10-1/2 in. CF Control Rod . Rudder
- 1 ea 0.8mm x 9-1/2 in. CF Control Rod . Elevator
- 1 ea .015 in. x 18 in. Music Wire for control rods

Parts Bag:

- 1 ea Laser-cut Ply Control Horn & Bellcrank Set for Micros
- 1 ea .125 in. x 3/8 in. CF Tube Bellcrank spindle
- 1 ea .050 in. x 2 in. CF Rod Motor Support
- 1 ea 3/32 in. x 3 in. Balsa (Rcvr/Servo mount & bracing)
- 1 ea 1/64 in. x 3/4 in. x 1 in. Ply Nose Stiffener
- 1 ea 1/2 in. x 1/2 in. thin Velcro for battery attachment
- 1 ea 3/64 in. x 4 in. HST (heat shrink tubing)
- 1 ea 1/64 in. x 1/8 in. x 1-1/2 in. Ply for Control Rod Supports

THINGS TO KNOW

Make sure your kit is complete and undamaged.

Follow the step sequence given here for best results. Check off each step when completed to insure that none are skipped.

Study ahead, so you know what is coming.

Construction photos and updates to these instructions will be added to our website as the need dictates.

Please visit us at **www.M-A-E.com** for the latest information. Construction photos are at **http://www.M-A-E.com/Sub_Pages/Pictures-Videos/S3DM_BuildPics.htm**

STEPS IN A NUTSHELL

1. Prepare all foam parts and apply any desired graphics or coloring.
2. Decide what motor to use and where your radio gear will be mounted.
3. Cut openings in fuselage for receiver and motor.
4. Assemble CF backbone to Wing and Stab.
5. Glue bottom fuselage to CF backbone.
6. Assemble bellcrank and bellcrank guides to fuselage.
7. Make bellcrank control-rod and mount aileron servo.
8. Connect ailerons to bellcrank.
9. Attach Wing Struts to Wing and Fuselage.
10. Assemble Landing Gear to Fuselage (optional).
11. Mount receiver brick.
12. Attach top fuselage.
13. Mount motor.
14. Connect servos to rudder and elevator.
15. Mount battery & balance model.
16. Set control throws.

GENERAL CONSTRUCTION COMMENTS

Gluing your model together: We use Canopy Glue for most of the assembly. This forms a strong yet flexible joint, but takes longer to dry than UHU or CA glues. Apply glue to one surface, then press parts together. Separate parts and let dry for 5 minutes. Now press parts together again. Tape or weight if necessary until thoroughly dry.

For faster assembly, use UHU Creativ or GWS glue. Smear the glue on both surfaces to be joined and wait 7-8 minutes. Then carefully press the parts together. UHU Creativ is a contact cement, so make sure parts are in proper alignment before pressing them together. Do not apply this glue to surfaces that must slide by one another during assembly, such as the sides of tabs and slots.

DETAILED INSTRUCTIONS

1. Prepare foam parts and apply graphics or color:

Clean your foam parts by carefully vacuuming them or using a tack-rag to remove any foam dust. Graphics should be applied sparingly to save weight. Vinyl gets heavy in a hurry, so I do not recommend using it. If you purchased the air-brushed version, you are golden. Otherwise you may wish to apply colors using Sharpie pens or air-brush your own design using water-based acrylic paints and stencils cut from poster-board. Keep it simple and light!

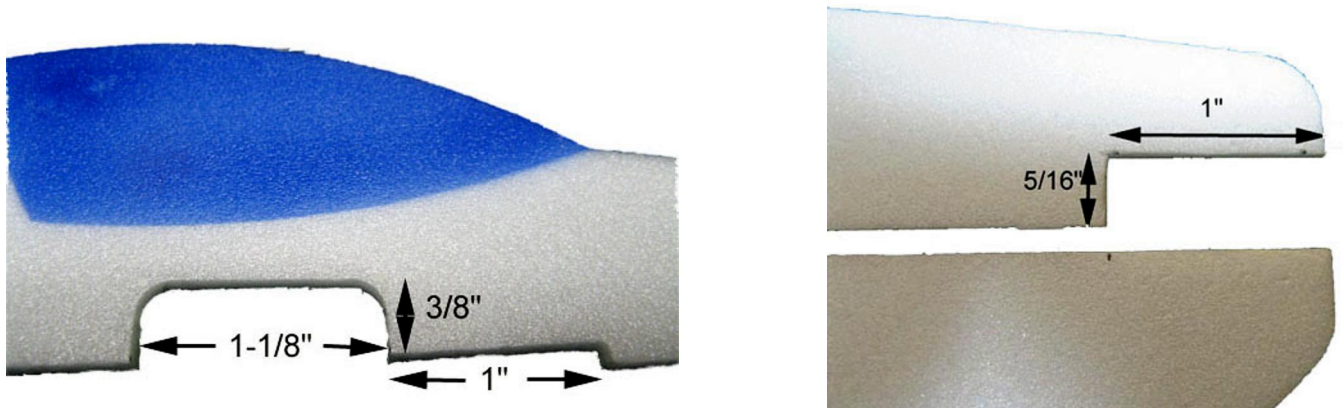
2. Decide on motor and location for mounting your radio gear:

Motor: First choose between a brushed or brushless motor. If you need help with this, contact me and I will try to help you. If you are using a brushed motor from a ParkZone plane, the length of the motor wires is different for each model and will affect the location options for mounting your receiver. The best brushed motor for this application is the 4-Site motor which has the most power and the longest motor wires. The P51 motor has equal power but shorter motor wires. The original Sukhoi motor is less powerful and has the shortest wires. All these motors can work, but just make sure you are aware of the various limitations.

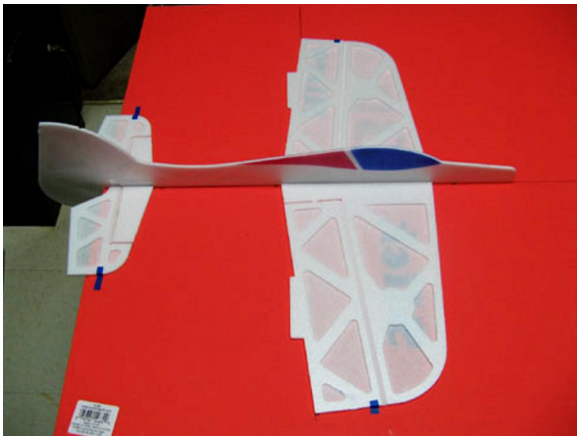
Receiver Location: Standard location is to mount your receiver atop the wing about an inch behind the leading edge. You need to cut an opening in the upper fuselage to accommodate this. Using our brushless motor setup will enable you to mount your receiver vertically behind the wing on the side of the fuselage and use shorter control rods to the rudder and elevator. Both work well, the choice is yours!

3. Cut openings in fuselage for your receiver and motor:

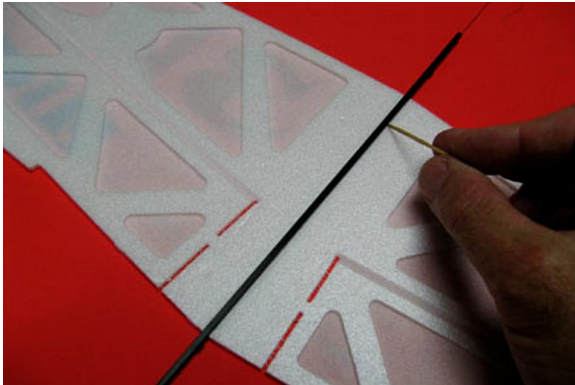
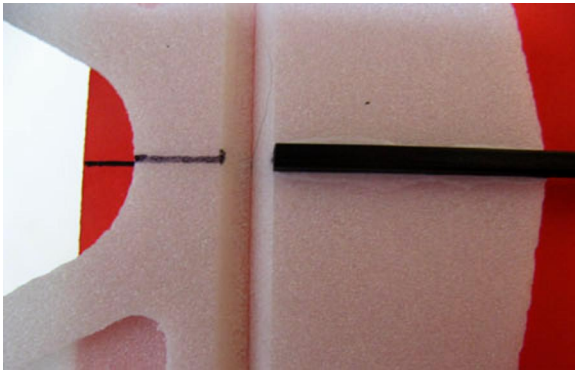
These notes apply to a brushed motor installation. For a brushless motor installation see the Assembly Pictures on our website.



4. Assemble CF backbone to wing and stab:

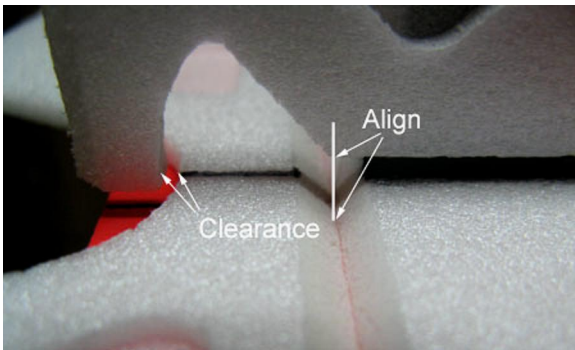
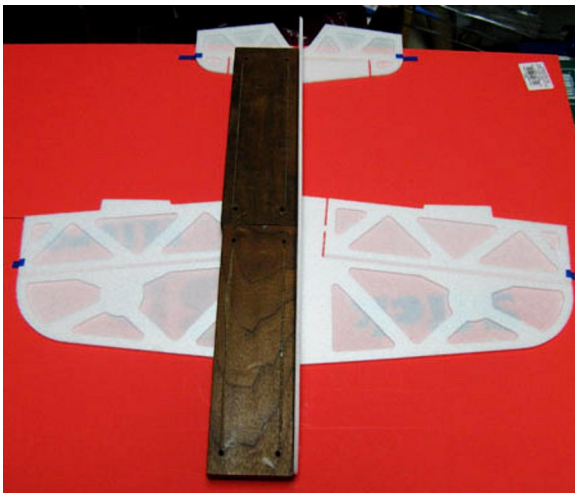


4A: Place your stab/elevator and wing upside down on a flat work surface. Now temporarily place the upper fuselage piece over them to set spacing and secure your alignment. Place a straight-edge along the fuselage to ensure it is straight. When satisfied that your stab/elevator and wing are centered and separated by the correct distance (fuselage placement assures this), tape the wing and stab/elevator to your work surface. Remove the fuselage and set it aside for later.



4B: Now you are ready to glue the CF backbone onto the stab/elevator and wing. It may be helpful to draw a centerline on your parts first, to aid in running a bead of glue where it is needed. Apply glue to the foam rather than the CF. This is very important: Align the rear of the CF backbone with the forward edge of the elevator hingeline vee as shown. The backbone should be right on the centerline you drew in Step 4A. If glue oozes out when you press the backbone in place, remove the excess with a toothpick as shown. Fractional grams count in this game - you do not want to build a porker here.

5. Glue bottom fuselage to CF backbone:



First, notice that the fuselage is slightly wider (3mm) than the CF backbone (2.5mm). Use a square to align the fuse bottom flush to the **LEFT** side of the CF backbone. Here I am using squared blocks to align the fuse flush to the CF backbone and assure that the fuse is perfectly straight and perpendicular to the wing and stab. When satisfied, carefully apply glue to the fuse and assemble.

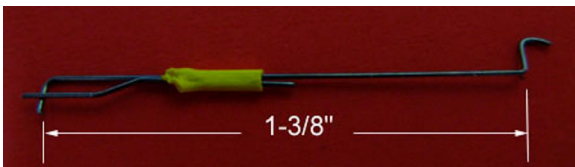
Proper fore-aft placement of the fuse bottom is critical. Position as shown, making sure you have a small clearance between the elevator and fuselage cutout.

6. Assemble bellcrank and bellcrank guides to fuselage:

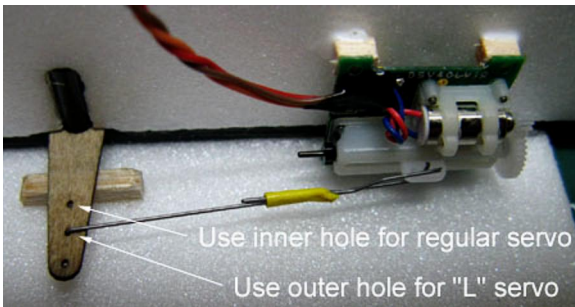


Slip laser-cut bellcrank over CF Tube Bellcrank Spindle and glue spindle into fuselage slot as shown. Make sure that top of spindle contacts bottom of fuse backbone. Be careful to not get glue on or near bellcrank. Also, make sure that the side of the bellcrank with 3 attachment holes is on the same side of the fuselage as your aileron servo will be mounted. Glue the spindle front and back on both sides of the fuselage. Take care to not get any glue near the bellcrank.

7. Make bellcrank control-rod and mount aileron servo:

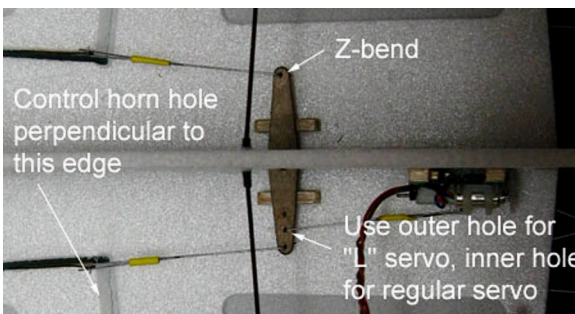


7A: Make control-rod from .015in music wire supplied. Make Z-bend first; needle-nose pliers work well. Next put a 1/2in piece of HST over the wire. Then measure 1-3/8in and make the L-bend. The spring-retainer is about 1in long. Place inside HST and shrink with heat. Secure with a drop of CA.



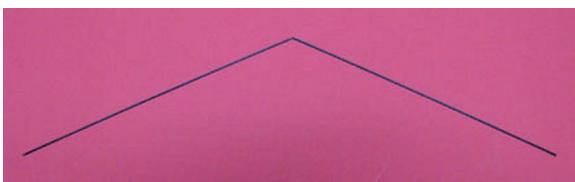
7B: Prepare servo by making mounting pads from 3/32in square balsa supplied, glue them to servo and let dry. Connect control-rod to bellcrank and servo, center your bellcrank, and then glue servo in place on side of fuselage as show. Ensure that bellcrank remains centered while servo is positioned in place just behind leading edge of wing.

8. Connect ailerons to bellcrank:

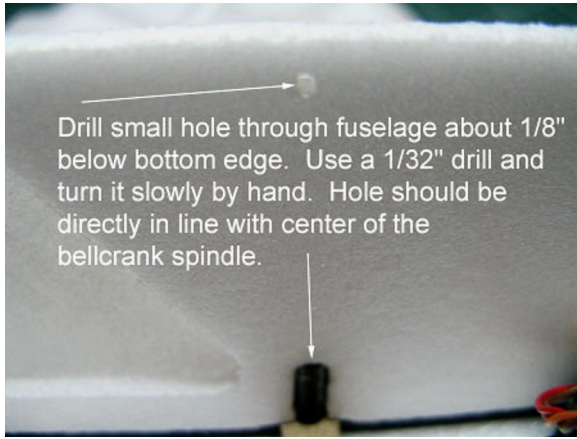


Make two aileron control rods from .015in music wire. Glue laser-cut aileron control horns to ends of ailerons with hole perpendicular to rear-edge of bevel as shown. Horns should be flush with top-side of ailerons. Connect control rods and adjust position of horns slightly if necessary to ensure that ailerons are in neutral position with bellcrank perpendicular to fuselage.

9. Attach Wing Struts to Wing and Fuselage:



9A: Make one-piece wing strut by rolling the supplied 0.8mm x 11in CF rod under your X-Acto knife to gently score the center of the rod. Now place your thumbs at the score mark and gently snap the rod, being careful not to break it.



Drill small hole through fuselage about 1/8" below bottom edge. Use a 1/32" drill and turn it slowly by hand. Hole should be directly in line with center of the bellcrank spindle.

9B: Insert the wing strut through the pre-drilled 1/32 in. hole in fuselage. Center the strut in the fuselage. Pull it out slightly and place a small dab of glue. Now push it past center and place a dab of glue on the other side. Pull it back to center, and complete step 9C before the glue dries here.

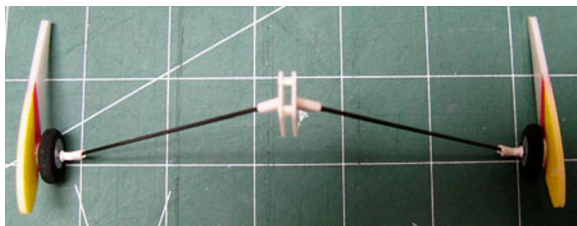


9C: Using your X-Acto, cut a slit at the angle of the strut where it will mount to the wing on each side. Struts should be perpendicular to the fuselage. Wiggle your knife to make the slit wide enough to accept some glue. Be careful to NOT puncture the top of the wing with your slit.

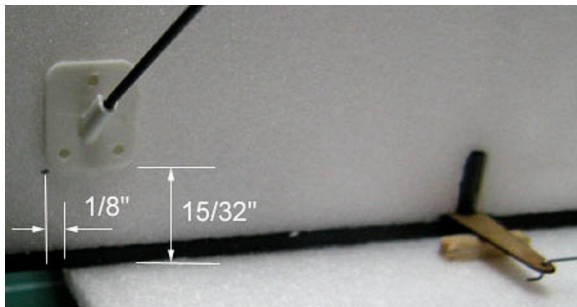


9D: Work some glue into your slit with a toothpick, then insert the strut, pressing it firmly in place. Now work glue around and under the strut with the toothpick as shown. Since your wing is still resting on the flat surface, perfect alignment is automatic. You DID leave it on the flat surface, right? Great! Now stand back and admire your work while the glue dries— preferably overnight.

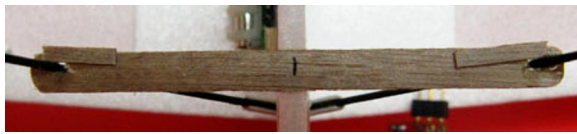
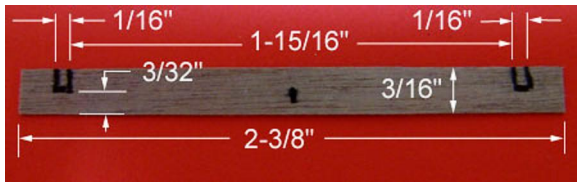
10. Assemble Landing Gear to Fuselage (optional):



10A: First temporarily assemble the white plastic fuselage mounts and glue the CF struts into them, making sure the struts slant rearward and the wheels and axles are in parallel alignment.

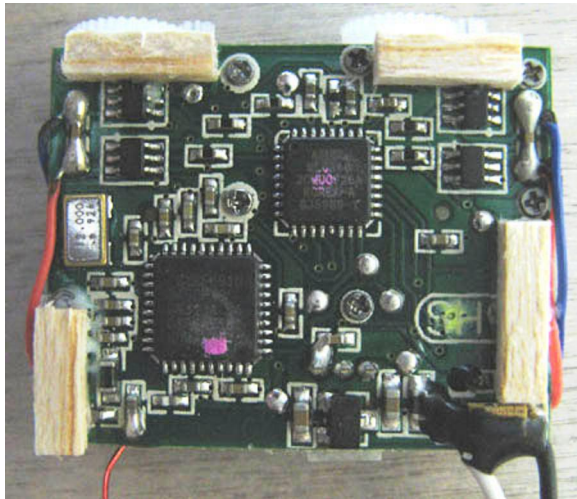


10B: Orient fuselage mounts as shown. Note that mounting holes are pre-drilled in fuselage. Glue the white plastic gear mounts to the fuselage, pressing them so the studs at least reach the 3 holes of the opposite mount. Make sure the wheels are properly aligned and parallel to the wing from side to side.

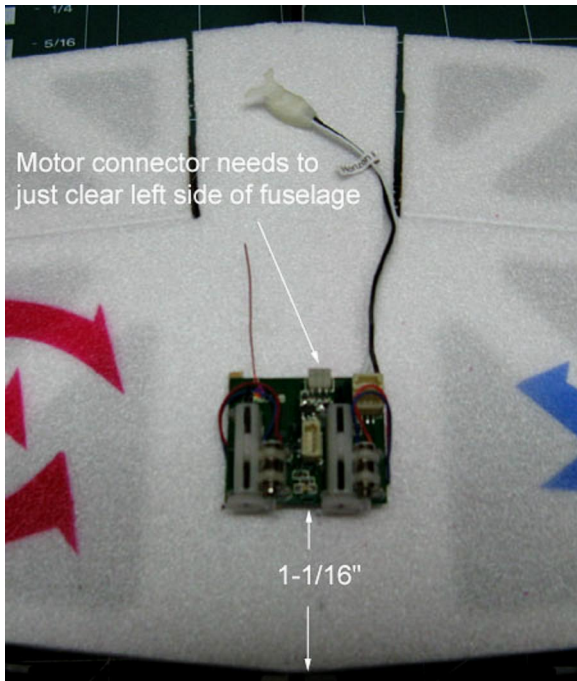


10C: Make gear support from 1/64in Ply supplied. Cut two 1/16in notches with your X-Acto as indicated. Now slip gear support over struts and glue to fuselage as shown. Again, make sure that wheels remain in proper alignment and parallel to wing side-to-side. You may want to glue small strips of ply over the notches as shown for extra strength, although not necessary.

11. Mount receiver brick:

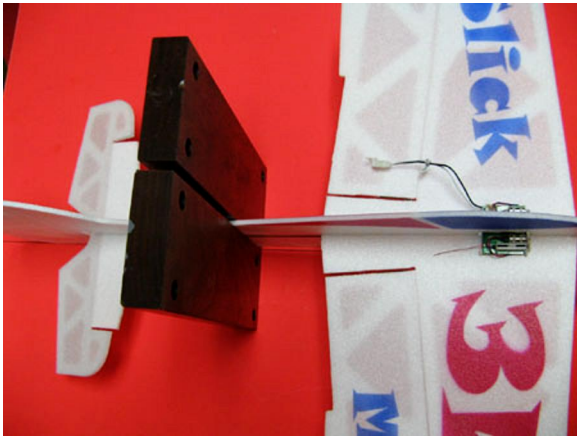


11A: Make receiver mounting pads from 3/32in sq balsa, supplied. Make pads 5/16 in. long so that all pads fit flush to the receiver board. Glue to board and let dry.



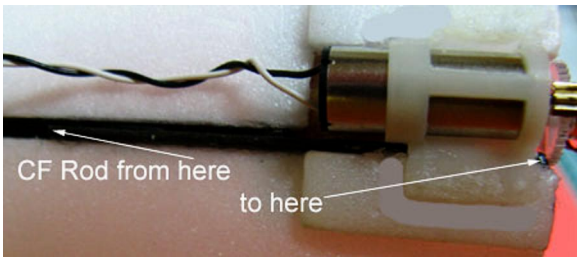
11B: Orient receiver as shown and glue to wing, making sure that the motor connector will just clear the left side of the fuselage top when that is glued on later. The two servo slides should be approximately equidistant from the fuselage as well. Note that you could turn the receiver 180 degrees from the position shown to accommodate shorter motor wires, since the motor connector on the brick would then be in front. However, doing that will require you to make some complex bends in your control-rod connection wires to clear the servo gears. Of course, another option would be to extend your motor wires - multiple possibilities here. The 4-Site motor wires are long enough to fit the configuration shown.

12. Attach top fuselage:

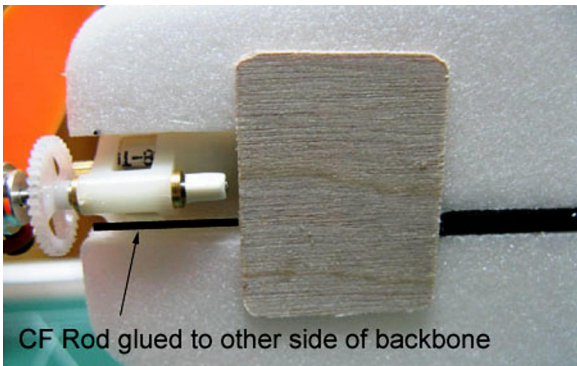


At this point, your fuselage top ought to fit like a glove. Just make sure that it is perfectly straight front-to-back when you glue it in place. Some type of temporary fixture to ensure alignment top-to-bottom can also be helpful. Here I am using squared blocks for this purpose. Do not forget to apply glue to the foam right behind the elevator.

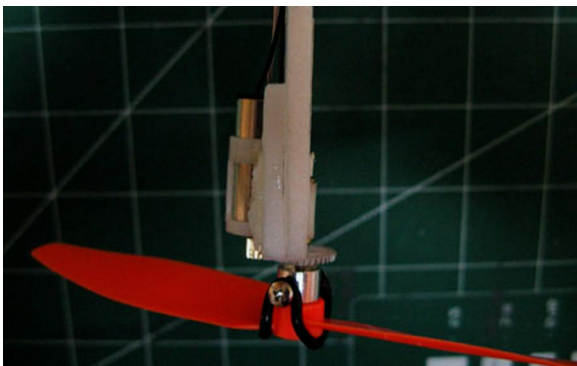
13. Mount motor:



Make fuselage doublers from scrap foam and glue them in place as shown on right side of plane. Glue motor to doublers and then add CF Rod motor support on right side and Ply nose stiffener on left side of fuselage. Make sure your motor wires will reach the receiver for plug-in later. Note that CF Rod motor support extends to the very front of the fuselage.

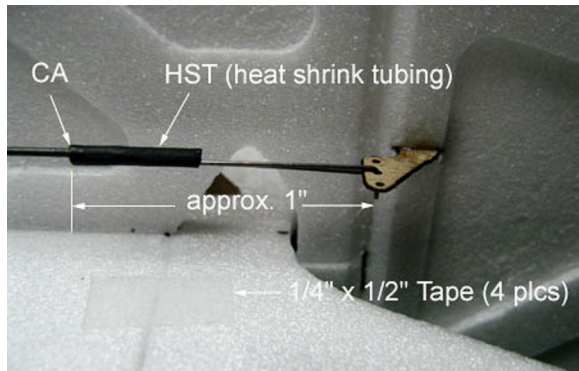
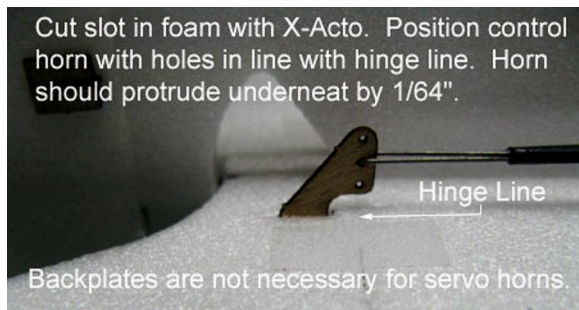


The Ply nose stiffener may not be necessary, but it does stiffen the nose quite a bit with minimal weight penalty. Make sure you glue it securely to the CF backbone as well as to the foam.



Here is a top view of the mounted motor. Note that the prop shaft is slightly offset to the left of center, which is perfectly OK.

14. Connect servos to rudder and elevator:



Step sequence:

1. Make two L-bend wires & spring retainers; fasten one to 10-1/2in rudder control rod and one to 9-1/2in elevator control rod, using 3/8in HST and drop of CA.
2. Glue rudder and elevator control horns in place.
3. Make two control rod supports from 1/64in x 1/8in x 2in Ply (supplied). Drill clearance hole in one end of each support and assemble one support to each control rod.
4. Fasten control rods to rudder & elevator.
5. Make two Z-bend wires.
6. Fasten to control rods with HST and shrink the HST to hold the wire in place, but still allow adjustments.
7. Ensure that servos and control surfaces are at their neutral positions.
8. Fasten control rods to their respective servos and install rod supports to fuselage, ensuring there is a slight bend to each control rod (stressed). Rod supports should be about half-way down each rod, but do not install them in a fuselage pocket.
9. Set control rod lengths with a drop of CA at the servo-end of the wire connections. You may wish to remove the control rods from your plane to avoid the possibility of getting CA on the foam.
10. Re-assemble rods to plane.

15. Mount battery and balance model:

Balance at 2-1/4ö behind leading edge of wing (at fuselage) to start. Adjust rearward to increase sensitivity and improve hovering, or forward to reduce sensitivity and increase stability.

16. Set control throws:

Use the middle holes in control horns with AR6400L receiver, or inside holes with AR6400 receiver.

Exponential: -70% recommended on all surfaces

Low Rates: We do not use low rates, just expo. If you use low rates, set them to 60% of high rates.