

K-3215



# FIBERGLASS Orangutan™ Dual Deploy

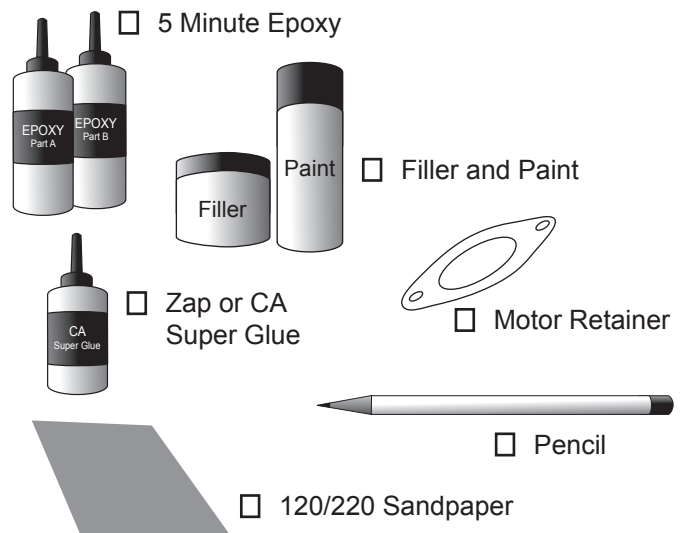
## Specifications

Length: 70.5"  
Diameter 4"  
Weight: 8 lbs  
Motor Mount: 54mm  
Fins: 6 - 1/8" G10  
Estimated CP: 55" from nose tip

## Parts List

- (1) Black fiberglass 4:1 ogive nose cone
- (1) Pre-slotted 32" florescent orange airframe
- (1) Payload 21" florescent orange airframe
- (1) Florescent orange 9" coupler
- (1) Florescent orange 1" spacer ring
- (2) Black centering rings
- (5) Black bulk plates
- (1) 54mm 22" motor tube
- (6) Black 1/8" G10 fins
- (4) Eyebolts, (10) nuts, (10) washers
- (2) 1/4-20 x 10" threaded rods
- (1) Nylon shock cord (30')
- (2) Rail buttons and screws
- (3) Rivets
- (1) Vinyl Decal

You'll need these items to complete this kit



Please make sure you read all directions and understand how to assemble your model before you start construction. It is also a good idea to test fit each part before assembly.

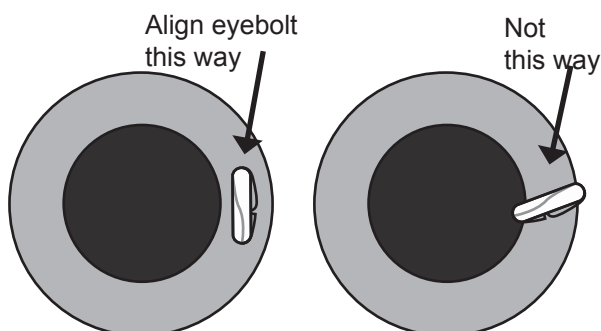
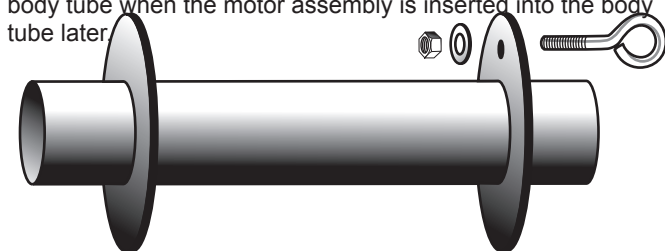
Fiberglass parts still contain small amounts of mold release and other materials on the surface that will inhibit adhesives and/or paint. It is important to clean each part prior to assembly with a solution of 1 part rubbing alcohol, 3 parts water and a drop of dish washing soap. **IMPORTANT:** do not sand any parts until after you have cleaned them - you will embed the materials you are trying to clean making it difficult to clean.

Some G10 parts may have holding tabs left over from the CNC machine. These small tabs will need to be sanded off before assembly.

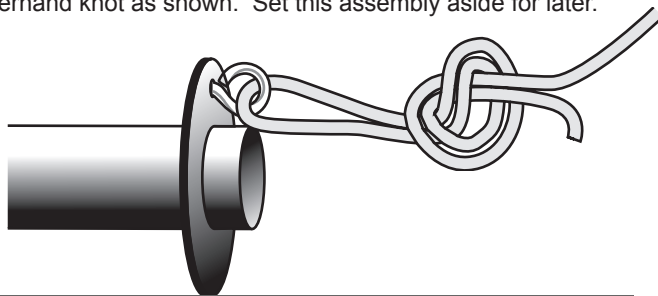
**IMPORTANT:** Before assembling any part with epoxy, rough up the surface to be epoxied using 60-80 sandpaper. The scratches in the fiberglass surface will give the epoxy something to grab onto. Epoxy will not soak into the fiberglass like wood or cardboard - epoxy will not grip very well to fiberglass without this rough surface. You can use Zap or CA glue to tack parts into place before you apply epoxy.

## Motor Mount Assembly

- ☐ Step 1 - Rough the surface of the motor tube where the centering rings will contact it - also rough the surface where the fin tangs will contact the motor tube.
- ☐ Step 2 - Test fit the centering rings over the motor mount tube and sand if necessary. Also test fit the centering rings in the body tube and sand if necessary.
- ☐ Step 3 - Mark the motor tube 5/8" from the aft end of the motor tube. Spread some epoxy on the motor tube around the mark and slide the aft centering ring on the tube until it aligns with the mark. Make sure the aft end is clear of epoxy for a motor retainer.
- ☐ Step 4 - Drill a 1/4" hole in the forward centering ring for the eyebolt. Mark the motor tube 3/8" from the front of the motor tube. Spread some epoxy around the mark and slide the centering ring on the motor tube until it aligns with the mark. Make sure you have at least 20 5/8" between the rings to clear the fin slots when the motor is inserted into the airframe.
- ☐ Step 5 - Mount the eyebolt using the nut and washer in the forward ring hole. Apply some epoxy to the threads of the eyebolt and nut to ensure it will not come loose later. Make sure the eyebolt is aligned so that it will not interfere with the body tube when the motor assembly is inserted into the body tube later.



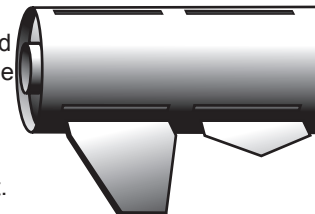
- ☐ Step 6 - Cut the single 30' shock cord into 2 equal sections. Attach one end of the one shock cord to the eyebolt using an overhand knot as shown. Set this assembly aside for later.



## Body Tube Assembly

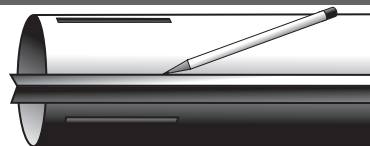
- ☐ Step 7 - Using the motor tube assembly, wrap the shock chord into a small bundle and stuff it inside the motor tube for this next step. Test fit the motor tube assembly into the aft end of the body tube to ensure a snug fit. Sand the centering rings if necessary. Make sure you rough up the inside of the body tube where the centering rings will attach.
- ☐ Step 8 - When you are satisfied with the fit, spread some epoxy on the inside of the body tube just in front of the fin slots and slide the forward centering ring of the motor assembly into the body tube. **Make sure you have the motor assembly facing the right way - the centering ring with the eyebolt should slide in first!**

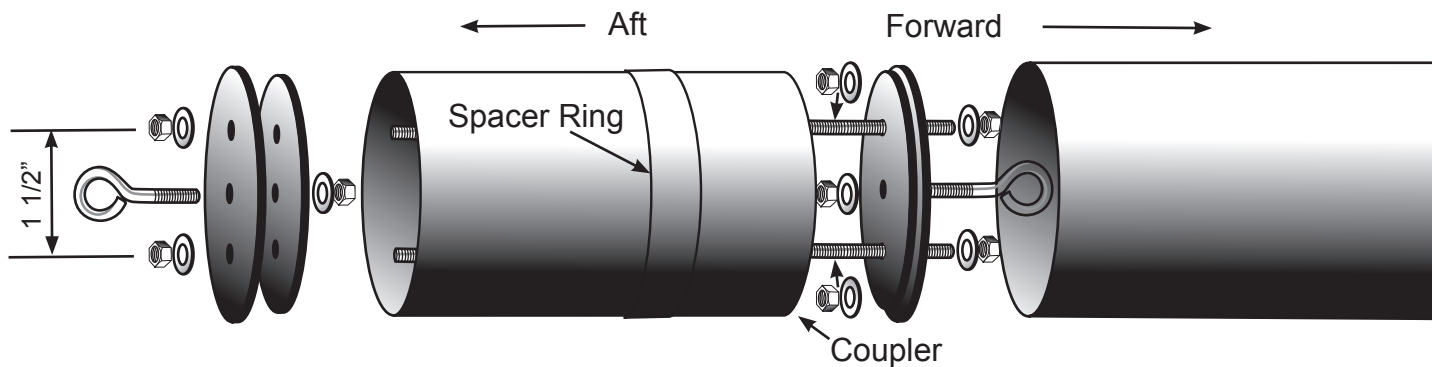
Keep going by spreading some more epoxy on the inside of the body tube near the aft edge before sliding the aft centering ring into the body tube. Continue sliding the assembly inside the body tube until the aft centering ring is all the way in body tube, but doesn't yet interfere with the fin slots. It's a good idea to test fit a fin in each slot here before the epoxy sets. Hold the body tube with the motor tube assembly down until the epoxy sets. Make sure the weight of the motor assembly doesn't cause it to slide out of alignment.



## Rail Button Attachment

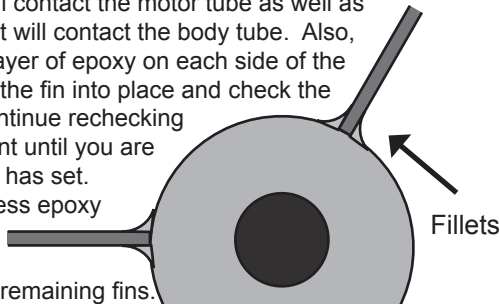
- ☐ Step 9 - Using a door jam or small section of angle stock, pencil a line halfway between two of the fins on the main body tube that extends from the front to the back of the body tube.
- ☐ Step 10 - Drill a 5/64" hole on the rail button line for the forward and aft rail buttons. The aft hole should be 1 1/2" from the aft end of the body tube and the forward hole should be at the CP. The CP is measured from the tip of the nose cone.
- ☐ Step 11 - Apply a small amount of epoxy in the holes and attach the rail buttons using the supplied #6 wood screws. Make sure the screw is loose enough for the rail button to spin freely - this ensures the button is not compressed to the point it will hang on the rail guide. **IMPORTANT: The screw from the forward rail button should be behind the forward centering ring. If it isn't, make sure the forward rail button screw protruding through the body tube doesn't snag the chute. Epoxy over the screw to provide a smooth surface. The screw can also be cut shorter.**





## Fin Assembly

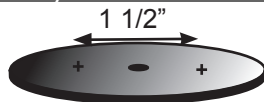
- ☐ Step 12 - Test fit each of the fins into the pre cut fin slots. The fin should seat firmly against the motor tube - sand each fin if necessary. Don't forget to rough up all surfaces. When you are satisfied with the fit, apply some epoxy to the end of the fin tang that will contact the motor tube as well as any fin root that will contact the body tube. Also, spread a thin layer of epoxy on each side of the fin tang. Slide the fin into place and check the alignment. Continue rechecking the fin alignment until you are sure the epoxy has set. Clean any excess epoxy from around the fin joint. Repeat for the remaining fins.
- ☐ Step 13 - Next, apply epoxy fillets to both sides of each fin. Carefully smooth the epoxy fillets with your finger before the epoxy sets. Allow each fillet to set before rotating the airframe for the next fillet.



- ☐ Step 18 - Drill a 1/8" hole in each bulkhead to allow the ematch wire to pass through later.
- ☐ Step 19 - Epoxy the spacer ring (short body tube section) to the coupler at the mid point of the coupler. Make sure this section is aligned properly by temporarily sliding the airframe onto the coupler - make sure you don't accidentally glue the airframe to the coupler. Also, make sure there is no epoxy left on the outside of the coupler that would interfere later with the airframes.
- ☐ Step 20 - Insert the coupler into the aft end of the **FORWARD** airframe and temporarily tape it in place with masking tape - **DO NOT GLUE**. Drill 3 evenly spaced rivet holes around the airframe using a 5/32" drill bit. These holes should be 1" from the aft end of the forward airframe. After you drill the first hole, insert one of the rivets to ensure the body tube alignment doesn't change while drilling the remaining holes. To insert the rivet, push in the rivet until the base of the rivet is flush with the body tube, then push the cap until it is flush with the body tube to lock it in place. Remove the rivet by pulling up the cap to unlock it and then pulling up on the base to remove the rivet. This configuration allows you to remove the bay so you can easily set up your altimeter bay for flight. Draw an alignment mark across the spacer ring and forward airframe to allow you to line up the rivet holes after removal. **IMPORTANT:** these rivets are estimated to have a shear strength of 75lbs.
- ☐ Step 21 - Mount your altimeter switch if needed (not included) and drill any vent holes if required in the short body tube section. Refer to your altimeter manual to determine what is required for proper operation.

## Removable Altimeter Bay Assembly

- ☐ Step 14 - Mark one of the bulkplates as shown. Stack 2 of the large and 2 of the small bulkplates and temporarily secure the plates with a single eyebolt to hold them together. Drill through all 4 bulkplates at the points you just marked with a 17/64" drill bit.
- ☐ Step 15 - Start with one of small and one large bulkhead and attach the eyebolt and two threaded rods as shown in the diagram above. Use two washers and two nuts on each threaded rod to trap the G10 bulkheads. Most of the threaded rod should extend into the coupler. Leave about 1/4" of exposed threaded rod that extends forward. Use thread lock on all nuts to make sure they doesn't come loose later.
- ☐ Step 16 - Insert the bulkplates into the forward end of the coupler with the threaded rods inside the coupler. Do not glue so you can remove later.
- ☐ Step 17 - Carefully align the remaining large and small bulkhead using the center hole and attach them together using the remaining eyebolt. Use thread lock to make sure the eyebolt doesn't come loose later. The smaller bulkhead will go into the coupler first. **IMPORTANT:** do not glue the bulkheads into the coupler - they need to be removed to insert the altimeter sled. Insert onto the open end of the coupler and attach with the remaining washers and nuts. **IMPORTANT:** do not use thread lock on these nuts so they can be removed later.



## Nose Cone Assembly

- ☐ Step 22 - Test fit the remaining small bulkplate into the base of the nose and sand if necessary.
- ☐ Step 23 - Mount the eyebolt with a nut and washer into the remaining small bulkplate and secure with epoxy so it will not come apart later.



## Final Assembly

- ❑ Step 24 - Assemble your model and insert the largest motor you intend to fly (or simulate the weight with a substitute) and ensure that the CG is at least 1 body diameter in front of the estimated CP point specified on the first page. The CP point is measured from the tip of the nose cone. If the CG is behind the desired point, add weight inside the nose cone by pouring lead shot into the nose cone tip and adding some epoxy.
- ❑ Step 25 - Epoxy the bulkplate into the base of the nose cone. Leave about 3/8" for a fillet. After the epoxy sets, apply a fillet around the inside edge.
- ❑ Step 26 - Drill a small 1/8" hold in the chute compartment to allow venting. Make sure you do this without the chute in the chute compartment.
- ❑ Step 27 - Using the second shock cord, attach one end to the nose cone and the other to the forward side of the altimeter bay. Attach the other side of the shock cord you attached to the motor mount to the other side of the altimeter bay.
- ❑ Step 28 - At this point install your positive motor retention device. The kit does not include a motor retention device and this will need to be purchased separately.
- ❑ Step 29 - Your model is now ready to apply the vinyl decal. To apply the cut lettering decal, carefully remove the backing from the decal - the individual letters will remain stuck to the top carrier. Next, position the decal where you would like it and carefully smooth out the top carrier to ensure the letters are securely attached to the rocket body. Last, carefully remove the top carrier making sure the letters stay attached to the rocket body and are not lifted with the carrier.

Now go have some fun!

## Flying Your Model

**IMPORTANT:** always use positive motor retention to secure the motor. Failure to use motor retention will cause the motor to be ejected instead of the parachute making for a dangerous ballistic reentry.

**IMPORTANT:** always remember to check your balance point and ensure your CG is forward of the specified CG point.

**IMPORTANT:** Always follow the NAR safety code and remember that rockets are not toys and can be dangerous if not prepared and used properly. If you are a beginner, it is a good idea to fly with a club or other group of experienced rocketeers until you have gained some experience.

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**IMPORTANT:** Please contact us via phone or email if you have any questions about constructing or flying your model.



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