

# Fat Man

## Kit Features:

- 10" diameter airframe
- Stands 51" tall
- Fiberglassed body tube
- Fiberglass nose cone
- Baltic Birch fins
- Dual Deployment Ready
- 98mm motor mount
- For I through M impulse

Great for fun flying and Level 1 through Level 3 certification, the Fat Man is easy to build and lots of fun to fly.

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## List of Materials:

- (1) 10" Fiberglass nose cone
- (1) 10" Fiberglassed body tube
- (1) Nose cone bulkhead, 7.5" diameter
- (1) 98mm motor tube
- (1) Piston stop tube section (98mm coupler, 2" long)
- (1) Piston tube section (98mm coupler, 4" long)
- (1) Piston bulkhead, 3.75" diameter
- (1) Centering ring, 98mm, Drilled for U-Bolt
- (3) Centering ring, 98mm
- (3) Fins, 3.8" plywood
- (2) Electronics bay plates, 3" by 7" by 1/4" plywood
- (1) Fiberglass tape, 12'
- (3) U-Bolts with backing plates
- (2) Rail guides with screws
- (1) Tubular Nylon shock cord, 9/16" by 20' (drogue)
- (1) Tubular Nylon shock cord, 1" by 10' (main)
- (1) Instruction Manual

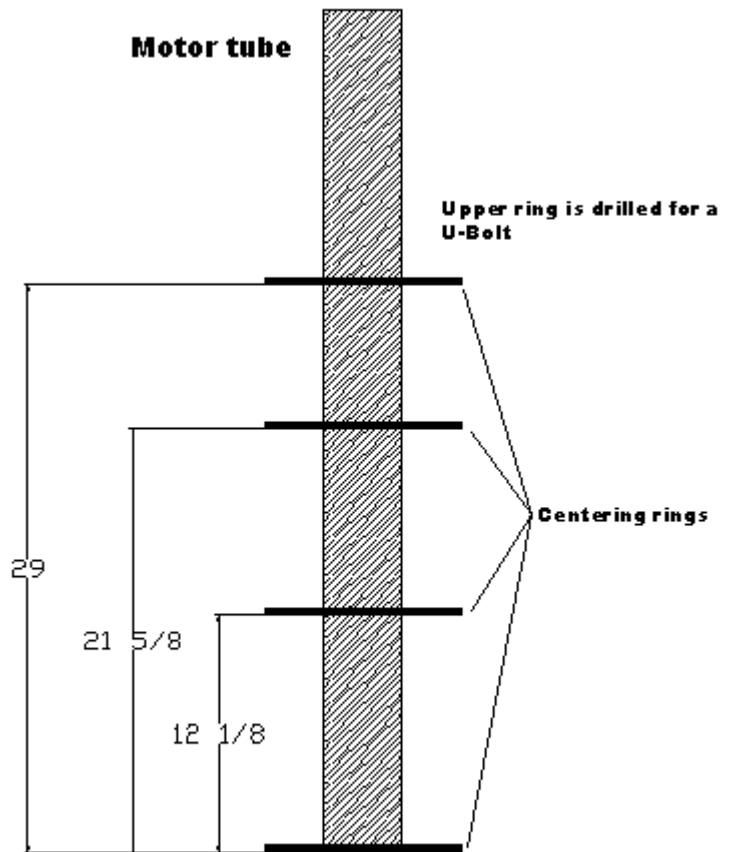
## Construction

*Please read and understand each step. The construction methods used in this kit differ from others in many ways. It is important to follow the instructions to ensure you get the most out of your kit.*

Locate the 98mm motor tube and one of the three undrilled centering rings. Epoxy the motor tube into the ring flush. Make sure the tube is perpendicular to the ring. Allow to cure.

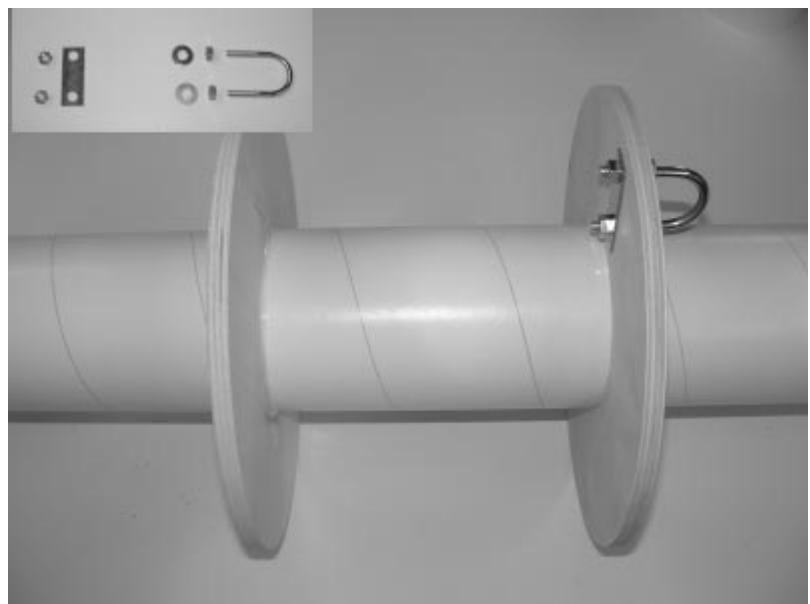


Position the remaining centering rings on the motor tube as shown. The upper centering ring is the one that is drilled for a U-Bolt. Take care to get the rings in the right position and perpendicular to the motor tube. This is critical the fins, rail guides, and electronics bay all depend on the rings being in the right position. Epoxy the rings into place, ONE AT A TIME, allowing the assembly to cure before proceeding onto the next ring.

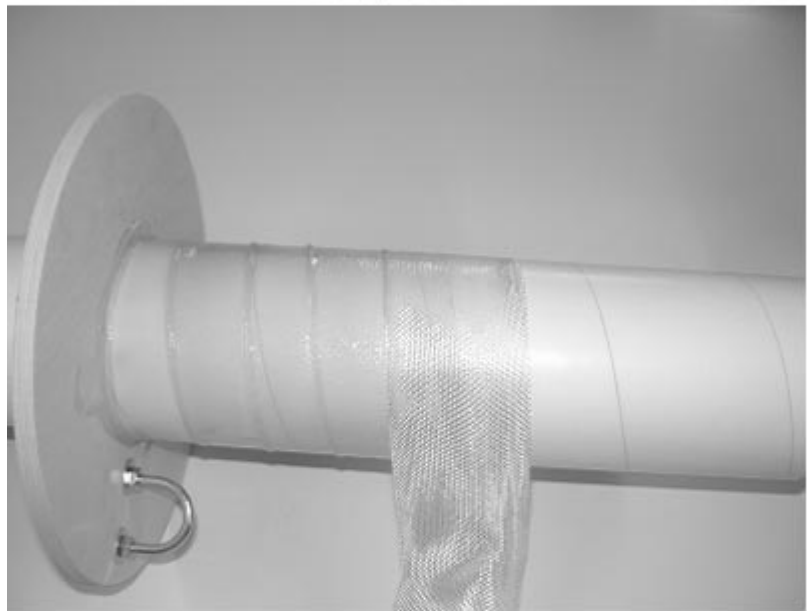
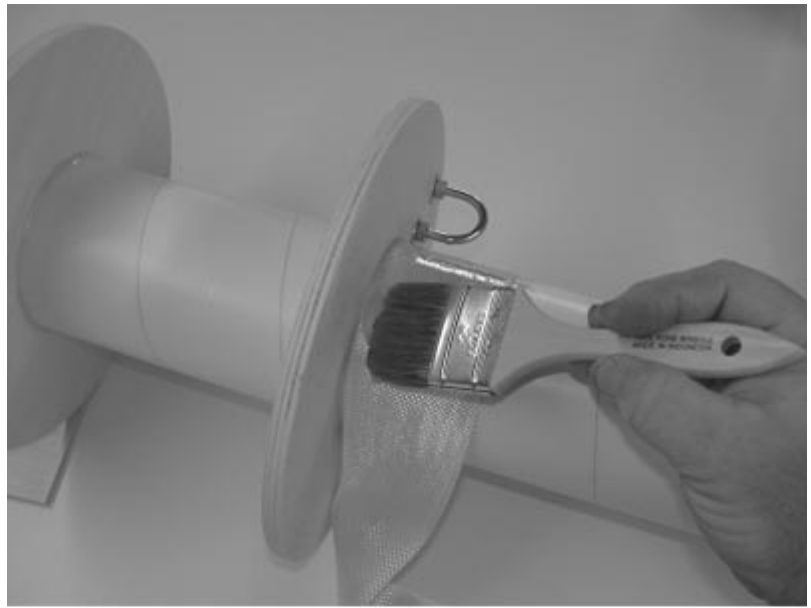


Dimensions are in inches, measurements are from the lower edge of the ring

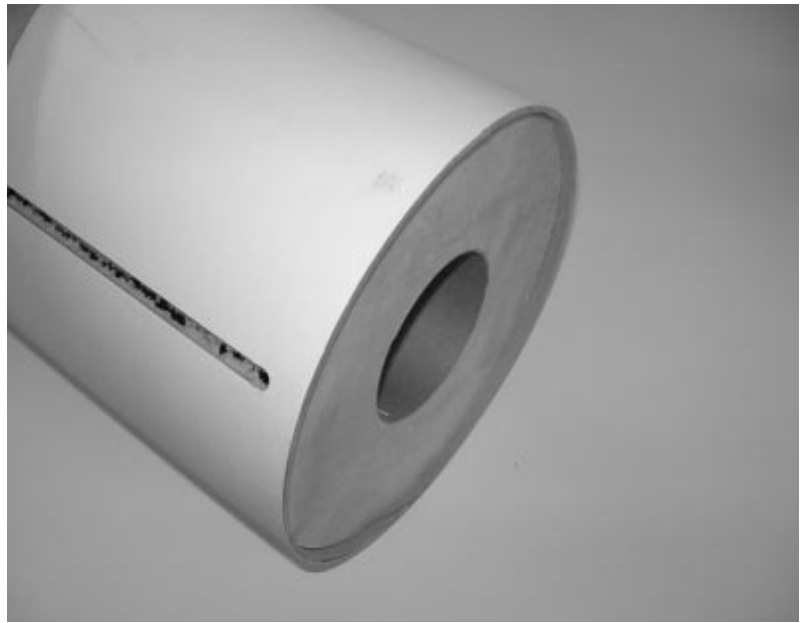
Mount the U-bolt to the upper centering ring as shown, using the hardware shown in the inset picture. Secure the threads with thread lock or epoxy.



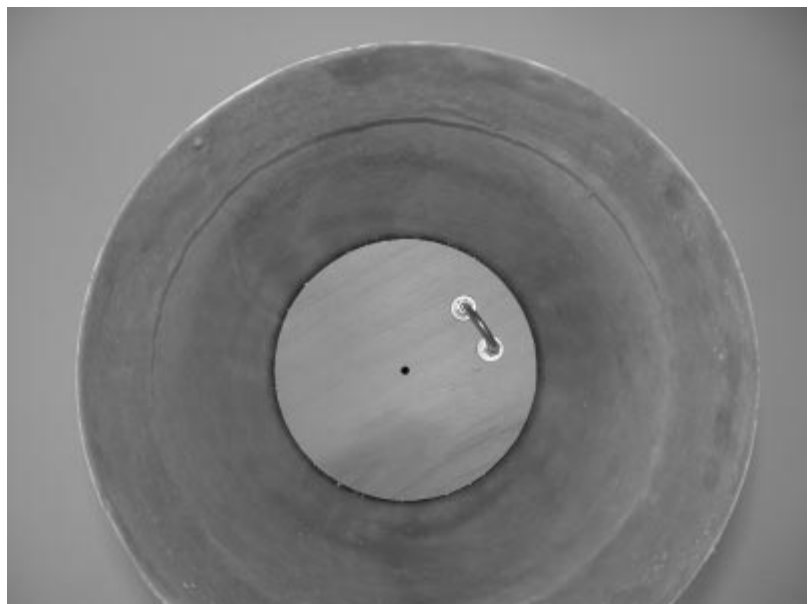
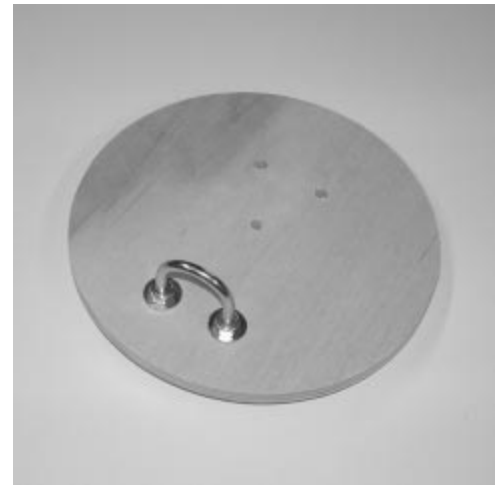
This next step is optional, but recommended. Fiberglassing the upper section of motor tube gives it a lot more strength. If you elect to not fiberglass the tube, please take care not to kink or dent the motor tube, this may prevent the main chute from deploying. Take the fiberglass tape provided and using a disposable paint brush apply the fiberglass to the upper section of motor tube. Apply the tape in a spiral fashion, painting epoxy or polyester resin on it as you go. Make sure you get all the air bubbles out from under the tape. **TAKE CARE NOT TO GET ANY RESIN INSIDE THE MOTOR TUBE.** Stand the assembly vertically and allow to cure. After the resin has cured, trim the excess glass from the end of the motor tube. You may trim up to 1/2" from the end of the motor tube if necessary, but the more you remove, the less area you will have for your main parachute.



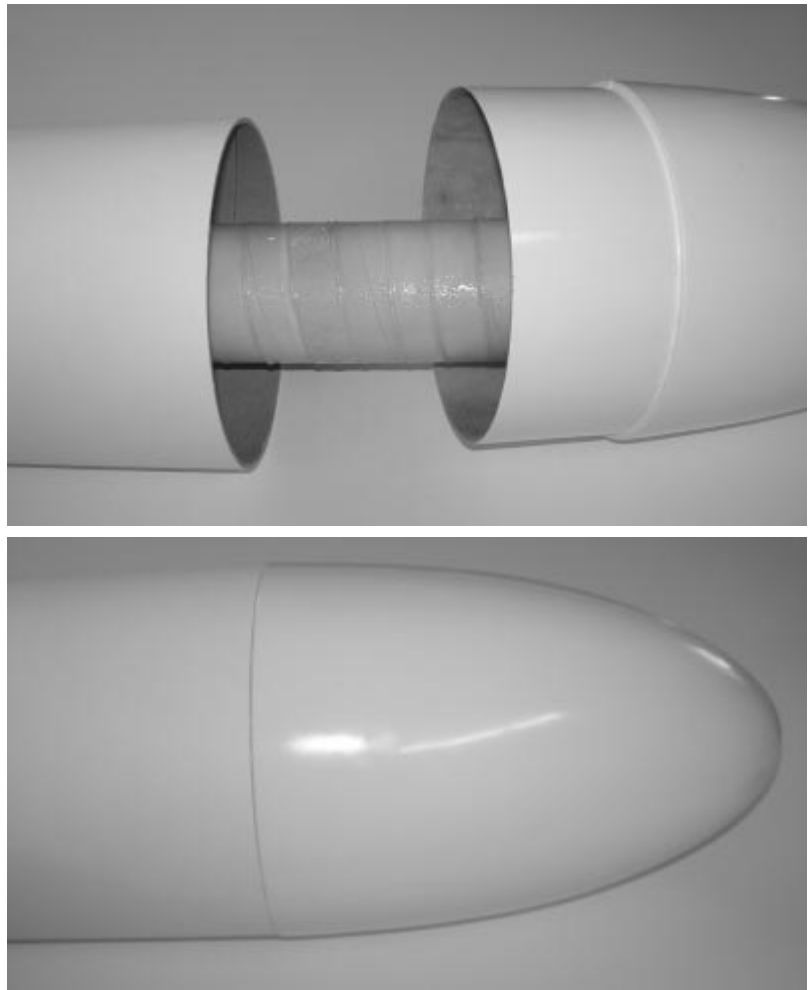
Slide the motor mount assembly into the body tube. Seat the lower centering ring  $\frac{3}{8}$ " in from the end of the tube. After test-fitting the assembly, remove it and epoxy it into place. You will not be able to get a lot of epoxy on the middle two rings, do not be concerned, there is plenty of strength with the upper and lower rings epoxied securely. Stand the assembly upright while the epoxy cures.



Mount the U-Bolt and hardware to the nose cone bulkhead. Secure the threads with thread lock or epoxy. Seat the nose cone bulkhead into the nose cone and tack it in using a few small drops of epoxy. **DO NOT PUSH THE BULKHEAD INTO THE NOSE CONE, THIS WILL DEFORM THE NOSE CONE.** You are not gluing it into place permanently at this time as you need to test the nose cone onto the body tube to ensure the motor tube does not hit the nose cone bulkhead.



Test fit the nose cone onto the body tube, it should seat all the way. If it does not, either the motor tube is hitting the nose cone bulkhead or the nose cone shoulder is hitting the upper ring. Determine what is hitting and either trim the motor tube or trim the nose cone. If you followed the dimensions carefully, there should be about 1/4" clearance for both the shoulder and the motor tube. If you have a good fit, remove the nose cone and securely epoxy the nose cone bulkhead into place. Use epoxy thickened with micro-balloons or leftover glass tape to make sure you get a good bond.



Take the piston stop tube (98mm coupler 2" long) and slit it into the upper section of the motor tube. Slide it in exactly 12" (from the top of the piston stop to the top of the motor tube). Now test fit the largest motor casing you plan on flying in the rocket and make sure it does not hit this piston stop tube. The rocket is designed to accept most 98/10240, or four grain casings.



Apply epoxy to the inside of the motor tube EXACTLY 12 1/2" in from the end, and slide the piston stop ring into the motor tube to the 12" point as shown. TAKE GREAT CARE NOT TO GET EPOXY ON THE MOTOR TUBE ABOVE THE PISTON STOP RING. This will cause the main chute piston to bind up. If you do get epoxy on the tube, wipe it off immediately with acetone.

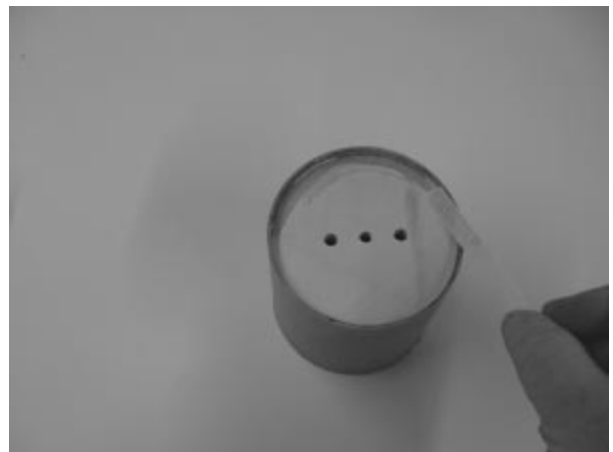
Allow to cure completely.



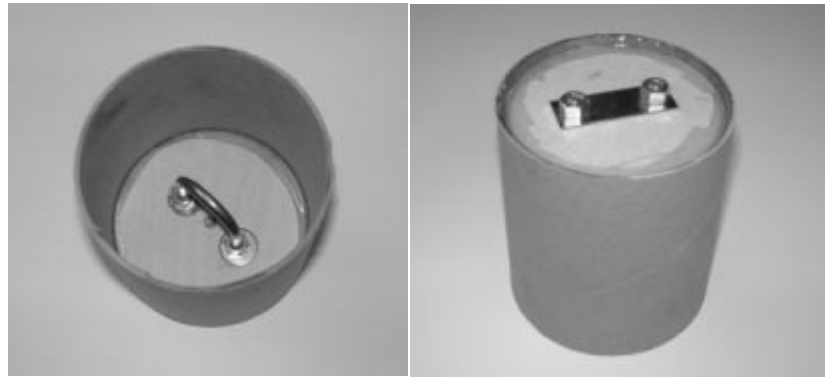
Position the piston bulkhead 1/4" in from the end of the piston tube (98mm coupler, 4" long). Epoxy the piston bulkhead into the piston tube. The bulkhead is loose so it will not deform the piston tube. Use a generous amount of epoxy here, applying it to both sides.



Here is the epoxy being applied to the bottom of the piston. Make a thick fillet of epoxy. Allow to cure completely.



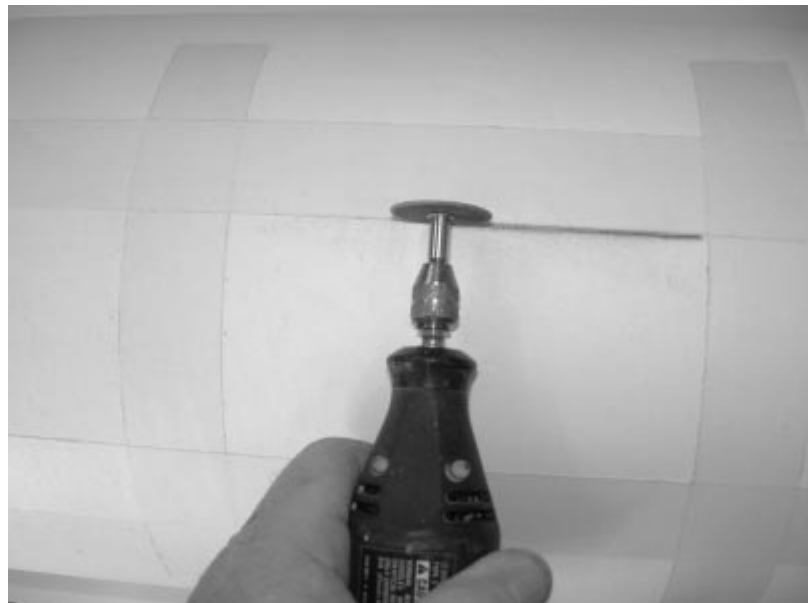
Install the U-Bolt hardware into the piston as shown. Secure the threads with thread lock or epoxy.



Mark the location of the electronics access hatch on the body tube. The top of the hatch must be located five inches from the top of the body tube, the bottom should be at eleven inches. Mark the location of the top and bottom of the hatch with masking tape. You can make the hatch from three inches wide up to six inches wide. Hatches wider than six inches can cause structural problems with the rocket.



Mark the sides of the hatch with masking tape as you did with the top and the bottom. Using a Dremel with an abrasive or metal blade, carefully cut the hatch out.

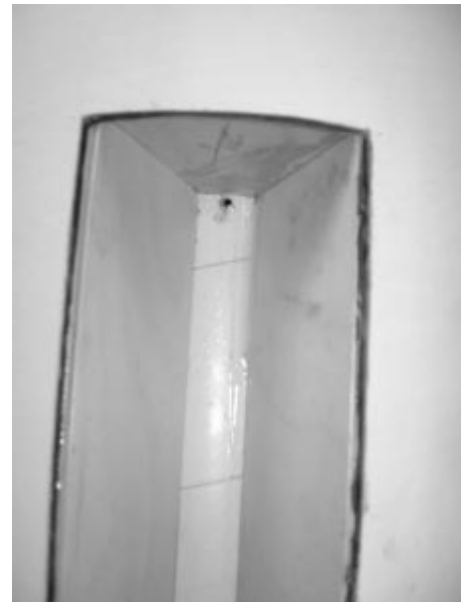


Test fit the two electronics bay plates into the electronics bay, keeping the plates perpendicular to the motor tube. The electronics get mounted onto these plates after the rocket is completed. You will need to sand the corners of the plates to allow for the epoxy used to secure the centering rings.



Drill a 3/16" hole in the upper section of the electronics bay, into the motor tube. This hole should go through both the motor tube and the piston stop tube. This is for your charges to eject the main parachute.

Drill a 3/16" pressure hole in the body tube just above the upper centering ring.  
Drill a 3/16" pressure hole in the electronics bay hatch also.



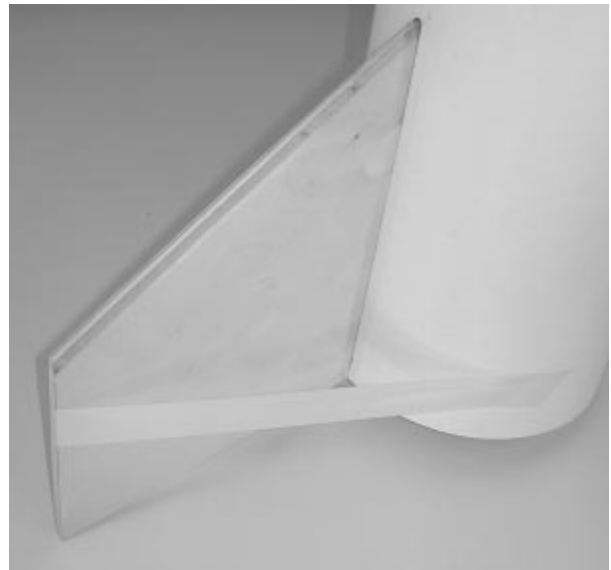
Test fit all three fins into their slots. The root of the fin **MUST** make contact with the motor tube. This is very critical, failure here will result in a crash.

Apply a bead of epoxy both sides of a fin as shown, then to the root edge of the fin. Slide the fin into place and wipe the excess epoxy away.



Secure the fin with masking tape while it cures. Make sure the fin is straight. Allow to cure completely. Repeat for the two remaining fins.

The rail guides are positioned  $22 \frac{3}{16}$ " and  $9/16$ " up from the bottom of the body tube. Drill a  $7/64$ " hole for the guides. You should drill into a bulkhead for both rail guides. If you miss the bulkhead, locate it by using the hold you missed with and drill another hole. It is important to get the screws into the bulkheads.



The nose cone shock cord is attached to the U-Bolt on the upper centering ring and the nose cone. The main shock cord is attached to the same U-Bolt on the body and the other end is attached to the piston. The main chute is packed tightly and slid into the motor tube on top of the piston. It is held in by taping paper over the top of the tube. The drogue sits outside the motor tube.

Balance your Fat Man in a "flight ready" configuration (motor or balast to simulate a motor and recovery system in place). The balance point should be no further back than 34" from the nose. Add weight if necessary. NOTE: Flying any rocket that has not been balanced can result in unstable and dangerous flight.

We recommend a 70" to 96" parachute for your Fat Man.

We would appreciate hearing from you. Enjoy your Fat Man and keep the pointy end up!

*Happy Flying!*

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