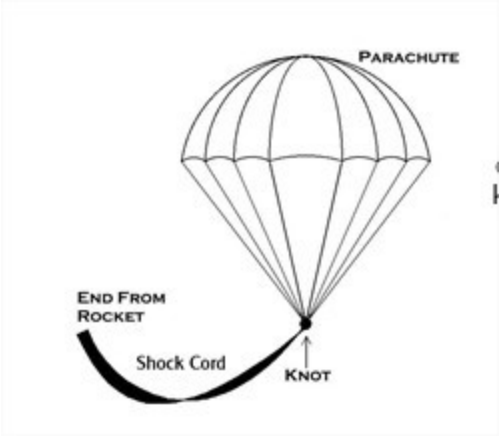
STEP 11

Knot shock cord through the eye bolt on the payload approximately 3' from the end. Attach quick link to the sewn shock cord loop and parachute to the quick link. Make a knot in the paracord. Good practice is also to add a swivel to minimize spin on decent.



STEP 12

For extreme altitudes it is recommended that (2) 1/16" holes be drilled into the main airframe 180 degrees apart about 1" below the seated payload section's bulkhead. These holes are necessary to vent out excess inside mainframe pressure, which could prematurely pop off the payload section right after motor burnout. If need be use masking tape on the coupler to ensure a snug fit to avoid drag separation.

Step 13

Lightly sand plastic nose cone with fine sandpaper to remove molding seam line. Also sand airframe and fins to produce a smooth finish. Paint with your choice of color! Spray rocket with primer, sand and repeat until smooth finish is obtained. Spray rocket with paint of choice, let dry. Apply protective clear coat.

FINISH

A good practice is to dab all tube ends with a thin CA glue before paint. This helps strengthen, resist water, and add longevity to your finished kit.

Sim!

This rocket is recommended for high power rocket motors F through H impulse. Depending on your flying field and finished weight, this is a very versatile kit. The Rocksim file is available on the 4" ULTIMATE product page on our website. Always check stability to ensure stable flight; the Center of Gravity (CG) must be forward of the Center of Pressure (CP) in flight ready condition.

Model Rocket Safety Code

1. **Materials.** I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.
2. **Motors.** I will use only certified, commercially-made model rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer.
3. **Ignition System.** I will launch my rockets with an electrical launch system and electrical motor igniters. My launch system will have a safety interlock in series with the launch switch, and will use a launch switch that returns to the "off" position when released.
4. **Misfires.** If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft.)
0.00–1.25	1/4A, 1/2A	50
1.26–2.50	A	100
2.51–5.00	B	200
5.01–10.00	C	400
10.01–20.00	D	500
20.01–40.00	E	1,000
40.01–80.00	F	1,000
80.01–160.00	G	1,000
160.01–320.00	Two Gs	1,500

LAUNCH SITE DIMENSIONS

5. **Launch Safety.** I will use a countdown before launch, and will ensure that everyone is paying attention and is a safe distance of at least 15 feet away when I launch rockets with D motors or smaller, and 30 feet when I launch larger rockets. If I am uncertain about the safety or stability of an untested rocket, I will check the stability before flight and will fly it only after warning spectators and clearing them away to a safe distance. When conducting a simultaneous launch of more than ten rockets I will observe a safe distance of 1.5 times the maximum expected altitude of any launched rocket.
6. **Launcher.** I will launch my rocket from a launch rod, tower, or rail that is pointed to within 30 degrees of the vertical to ensure that the rocket flies nearly straight up, and I will use a blast deflector to prevent the motor's exhaust from hitting the ground. To prevent accidental eye injury, I will place launchers so that the end of the launch rod is above eye level or will cap the end of the rod when it is not in use.
7. **Size.** My model rocket will not weigh more than 1,500 grams (53 ounces) at liftoff and will not contain more than 125 grams (4.4 ounces) of propellant or 320 N-sec (71.9 pound-seconds) of total impulse.
8. **Flight Safety.** I will not launch my rocket at targets, into clouds, or near airplanes, and will not put any flammable or explosive payload in my rocket.
9. **Launch Site.** I will launch my rocket outdoors, in an open area at least as large as shown in the accompanying table, and in safe weather conditions with wind speeds no greater than 20 miles per hour. I will ensure that there is no dry grass close to the launch pad, and that the launch site does not present risk of grass fires.
10. **Recovery System.** I will use a recovery system such as a streamer or parachute in my rocket so that it returns safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.
11. **Recovery Safety.** I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

Revision of August, 2012.

LOC—IV

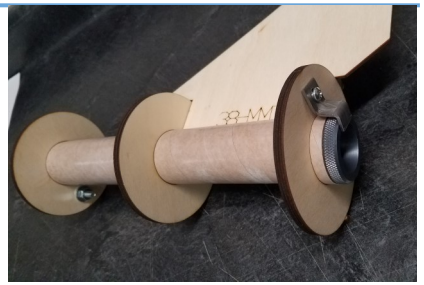
-23” Slotted Booster, 11” Payload
-Polypropylene Nose Cone
-36” Parachute
-15’ Nylon Shock Cord
-1x38mm motor tube
-1/8” Fin Set
-3 Centering Rings
-1 Bulkhead Assembly
-1 Coupler
-Launch lug
-MR-1 Retention (Zclip, T-nut)
-1 SCM-2 (eye bolt)

Due to the high thrust motors that can be flown in this rocket, epoxy is recommended!

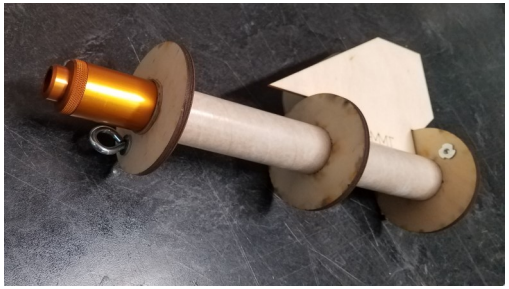
Before beginning construction, read over instructions to become familiar with the proper construction steps. **TEST FIT ALL PARTS!** Light sanding may be necessary to obtain proper fit.

STEP 1

Hammer or press the T Nut on the inside of the aft ring. Epoxy the outer edge of the T Nut to ensure it remains in place. Do not get glue inside the threads. The flange on the forward side is best. Install the eye bolt in the forward ring as shown. Be sure it is positioned so it will not touch airframe when installed. (see photos)



Step 2



Rough sand the motor tube to ensure proper adhesion. Slide the FWD ring onto the 38mm motor tube so the tube is 1/8” exposed from the ring. From the other end take the MID ring and slide up the motor tube 5.5”. Slide the AFT ring on leaving 1/8” of the motor tube exposed (if using an aluminum motor retainer, you would need to adjust the length of the motor tube exposed). Insert the fins into the AFT and MID ring slots to obtain proper alignment. Install the eye bolt in the forward ring and tighten. Epoxy each ring into place and fillet the intersection where the rings meet the motor tube. Epoxy the nut of the eye bolt.

STEP 3 DO NOT GET ANY EPOXY IN THE FIN SLOTS!

Slide the completed motor assembly into the airframe from aft up to forward. The assembly should slide up so the aft ring is recessed roughly 1/4” into the booster. Look into the fin slots to ensure the rings are properly positioned and will not interfere with fin installation. From the forward end, using a dowel or stick, apply a bead of epoxy around the forward end of the forward ring to secure the motor mount into place. Allow to dry. When finished turn the airframe upside down and apply a bead of epoxy to secure the aft side as well.

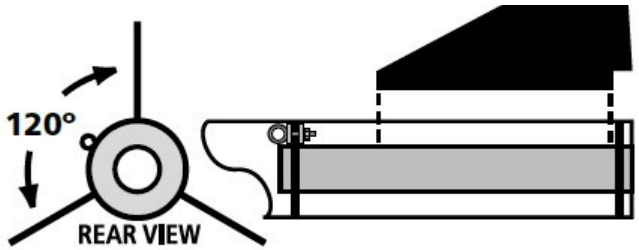
STEP 4

Attach shock cord to forward ring eye bolt. Pass loop through eye bolt, then pass shock cord through it’s own loop as shown. Don’t get any epoxy on the shock cord! Feed shock cord down one of the motor tubes out the AFT. **STEP 5**

Sand all fins smooth and round off the leading and trailing edges of them using medium, then fine sandpaper. Also bevel both sides of the fin root edge for better contact in the motor mount tube valley joints. For extreme flights, (J impulse and up) seal the fins with an epoxy to add strength and seal the wood grains.

STEP 6

Lightly sand the airframe around the fin slots to remove the glassine layer. Test fit the fins in the airframe fin slots. Sand fins, if necessary to obtain a proper fit. Place epoxy on fin root edge and place the fin down into the fin slot until it bottoms out on the motor mount tube. Keep the airframe in a horizontal position while drying. Make sure that the fin is straight up from the airframe tube. When dry, repeat this procedure with the remaining fins.



STEP 7

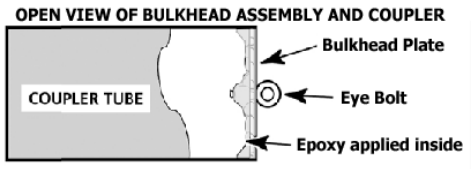
Give all fin joints ADDED epoxy fillets for MAXIMUM strength.

STEP 8

Using a guide such as a door-frame, mark a light pencil line exactly between any two fin slots from 5” up the airframe to 10” up the airframe from the bottom. This will be your guide for gluing on the launch lug.

STEP 9

Install eye bolt into bulkhead and epoxy in place. Epoxy bulkhead assembly in coupler recessed 1/8” or so and epoxy fillet both sides where the bulkhead meets the coupler. Allow to cure.



STEP 10

Slather epoxy a few inches into the payload around the circumference. Insert bulkhead assembly halfway in, approximately 4”. You may also screw or rivet the coupler in payload to leave the option for dual deployment down the road. Install nose cone into FWD end of payload. The cone can be epoxied in. OR use screws or plastic rivets to hold the cone on. Again this leaves the option for dual deployment in the future.