

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

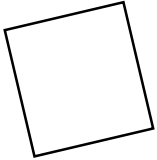
Before beginning construction, read over instructions to become familiar with the proper construction steps. Check Parts List to make sure you have all the parts.

**TEST FIT ALL PARTS!** Light sanding may be necessary to obtain proper fit.

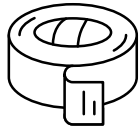
## ITEMS YOU WILL NEED TO BUILD THIS KIT



Glue  
(Epoxy  
Recommended)



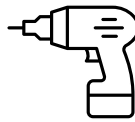
Sandpaper



Masking Tape



Pencil and Ruler



Drill



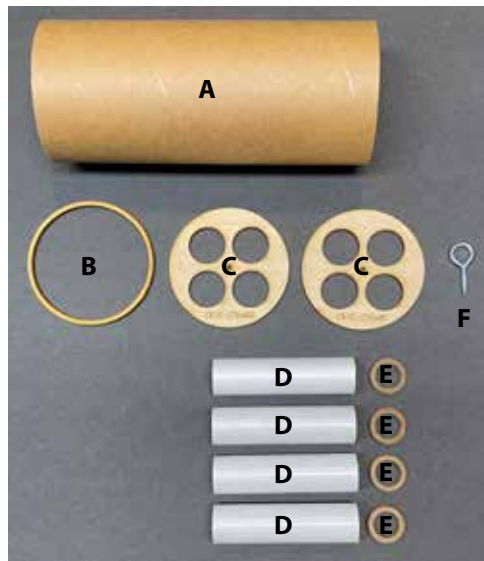
Paint

## Parts List

Check your parts before you begin to build your rocket kit.

- 2.56" Slotted Airframe
- Polypropylene Nose Cone
- 24" Parachute
- 9' Elastic Shock Cord
- Kevlar Shock Cord
- Fire Resistant Blanket
- Recovery Swivel
- Screw Eye
- 18mm Motor Tubes (4)
- 18mm Engine Blocks (4)
- Motor Can Thrust Ring
- Motor Can
- Motor Can Plastic Rivets
- 1/8" Laser Cut Upper Fins (4)
- 1/8" Laser Cut Lower Fins (4)
- Launch Lug
- Vinyl Decal Set

## STEP 1 - Thrust Ring / Airframe Assembly

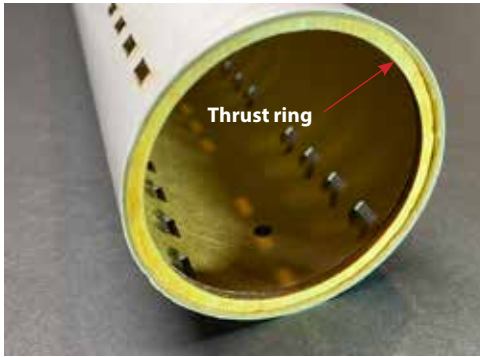


First begin construction by identifying all the components that make up the Modular Motor Can (MMC) assembly. The MMC is made up of:

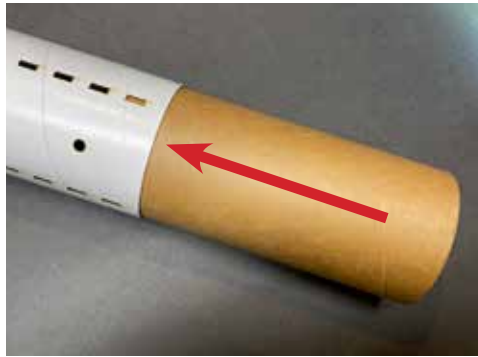
- A.** Motor Can Coupler
- B.** Motor Can Thrust Ring
- C.** Two 18mm Centering Rings
- D.** Four 18mm Motor Tubes
- E.** Four 18mm Engine Blocks
- F.** Screw Eye

Lightly sand the four 18mm motor tubes to remove the shine. Lightly sand the Thrust Ring and Centering Rings.

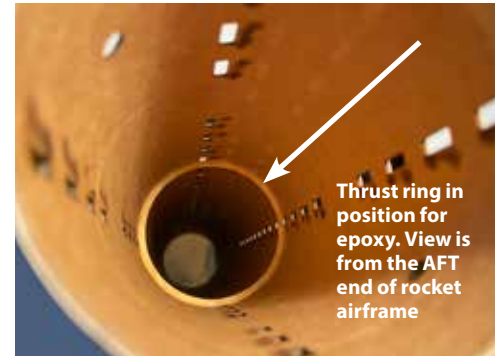
## STEP 1 - Thrust Ring / Airframe Assembly (continued)



Insert motor can thrust ring into the AFT (slotted end) of the airframe.



Then insert the motor can coupler into the AFT airframe end and push the thrust ring up into the airframe. Push the coupler up so that it is flush with the end of the AFT end of airframe. Then remove coupler.



You now have the motor can thrust ring in the airframe ready for securing in place.



With the thrust ring in position, apply epoxy to the FWD end of the ring with a stick.

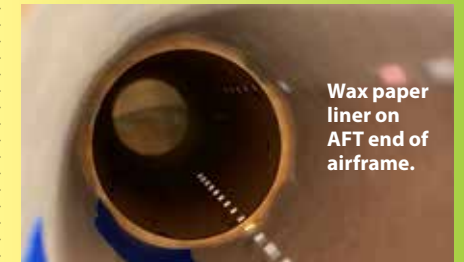
**Be sure to keep the aft side of the ring and airframe clear of epoxy!** Slather epoxy on the circumference of the FWD end of the thrust ring, allow to cure.

**Be sure to keep the aft side of the ring and airframe clear of epoxy!**

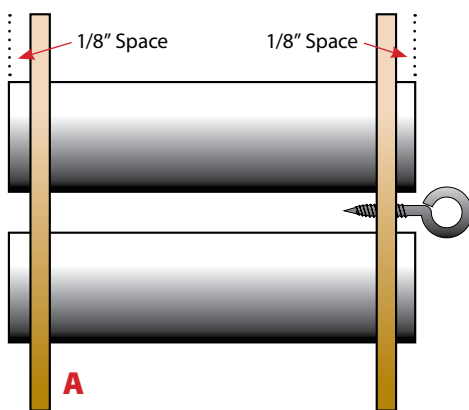
**Be sure not to move the thrust ring when applying epoxy!**

### LOC PRO Build Tip!

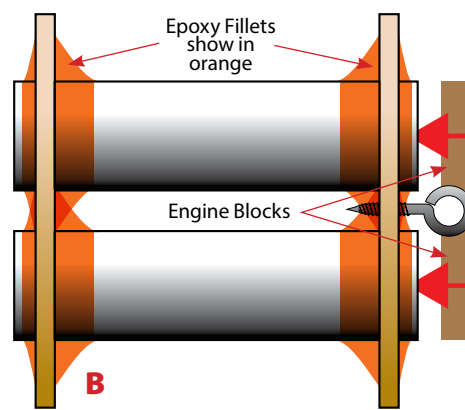
Line the inside of the AFT end of the airframe with wax paper before applying epoxy to the FWD side of the thrust ring. This will aid in keeping the AFT end free of epoxy drips.



## STEP 2 - 18mm x 4 Modular Motor Can (MMC) Assembly



Place a small amount of epoxy on the screw eye and thread into the hole on the FWD centering ring. After the screw eye epoxy has cured, place a small amount of epoxy on the bottom threads to prevent it from coming loose.

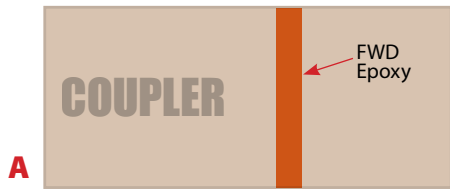


**A.** Mark the four 18mm motor tubes 1/8" from both ends of the tube. **The centering rings line up on the inside of these marks.** Note that you may need to adjust the AFT ring placement for use with your preferred motor retention. Once you have the centering rings aligned and all four



motor tubes are positioned, it is helpful to wrap all four tubes with masking tape to hold their position. **B.** When satisfied with the alignment, epoxy both centering rings in place, and allow epoxy to cure. Place a small thin bead of epoxy on the FWD end of each 18mm motor tube and glue the engine blocks in place, flush with the end of the motor tubes. Then apply epoxy fillets to both sides of the centering rings and allow to cure.

## STEP 2 - 18mm x 4 Modular Motor Can (MMC) Assembly - continued



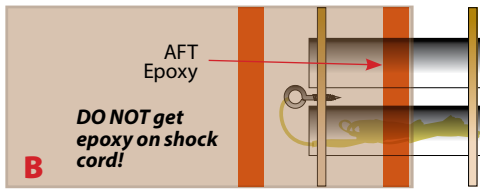
**A**

Tie one end of the provided Kevlar® shock cord to the eye bolt and use a small drop of CA glue to secure the knot. Then coil up the shock cord and stuff it into one of the 18mm motor tubes to keep it out of the way of the epoxy in the next steps.

Once the completed Motor Mount Assembly (MMA) has fully cured, test fit the assembly into the coupler tube and sand if necessary.



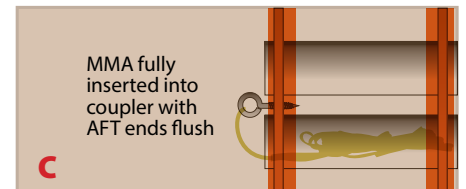
The completed Modular Motor Can (MMC) assembly ready for insertion into airframe.



**B**

**A.** Apply a bead of epoxy inside the coupler just before where the FWD centering ring will rest.

**B.** Partially slide the MMA into the coupler tube. Then apply a bead of epoxy just before where the AFT centering ring will rest.



**C**

**C.** Continue to slide the MMA into the coupler tube, ensuring the AFT end of the motor mount tube and the coupler tube are flush.

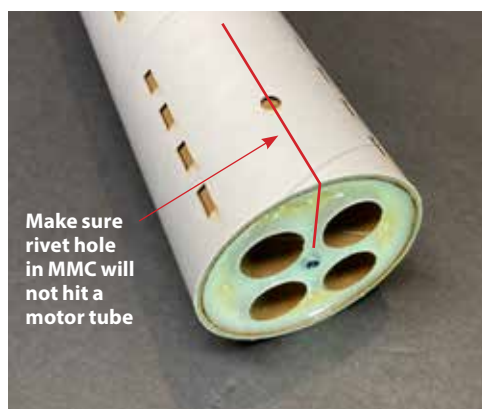
**Caution!** When inserting the FWD end of the motor mount assembly into the coupler, make sure that you **DO NOT** get epoxy on the Kevlar® shock cord!

### LOC PRO Build Tip! Multi-engine Motor Retention

Here is one of many ways to handle the motor retention on your multi cluster rocket. Cut the four prongs off a 4 Prong Threaded Blind Nut. Be sure to file the cuts flat. Then drill a hole large enough to fit the blind nut into the AFT centering ring. Epoxy in place. Then use a washer and the blind nut screw to secure your motors in place!



## STEP 3 - Modular Motor Can (MMC) /Airframe Assembly

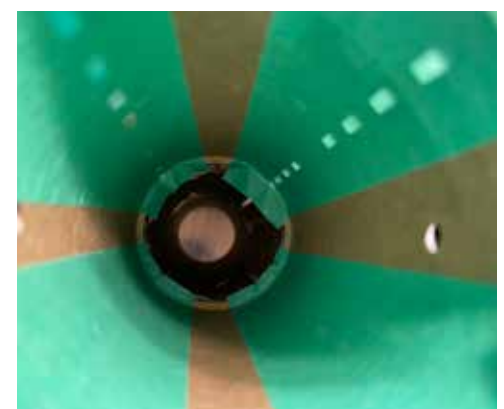


Take the completed Modular Motor Can assembly and insert it into AFT end of the main airframe. Ensure the coupler is flush with the AFT end of the airframe tubing.

**Rotate MMC so the plastic rivet will not interfere or hit a motor tube!** Mark holes for the plastic rivets on the MMC coupler



tube. Remove the MMC and carefully cut the holes with an Exacto® knife. (This can also be done by using a 13/64 drill bit). Reinsert MMC to check fit and alignment. Remove MMC for the rest of the rocket construction and painting.



Using painter's or masking tape, seal off the fin slots on the inside of the airframe. This will prevent epoxy from getting into the inner surface of the airframe.

## STEP 4 - Fins to Airframe Assembly



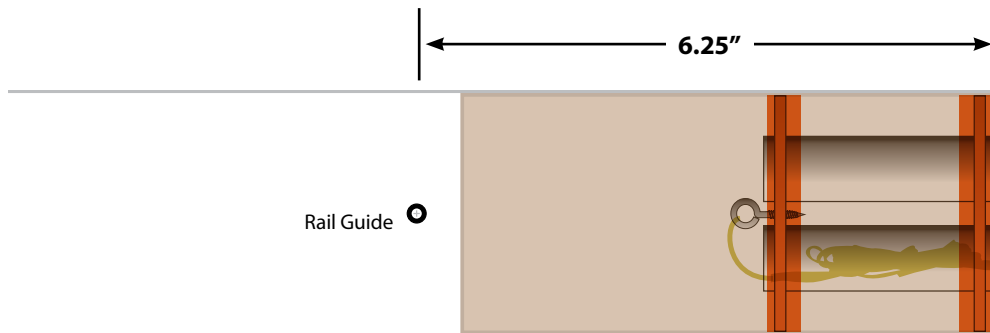
Lightly sand the airframe exterior on each side of the fin slots. This will remove the shiny glassine layer of the airframe and assist in the epoxy bonding the fin to the airframe while creating good adhesion.

**A.** Apply a generous bead of epoxy to the root edge of one upper fin and insert into the fin slot. Make sure the fin is at a right angle (90°) to the airframe. Allow the epoxy to cure before moving on to the next fin. Repeat the procedure for the remaining upper fins.

**B.** Then epoxy lower fins in place using wood strips and clamps to keep all fins aligned.

**C.** When all fins are in place, apply an external fillet to each fin-to-airframe joint. When cured, remove tape from ID of the airframe. Sand if necessary to remove excess epoxy.

## STEP 5 - Rail Guides / Launch Lugs Assembly



For the Phoenix, one rail guide will be used. Install the rail guide into the airframe with provided screws or nuts and bolts (your choice).

- Find the high point of the airframe between the fins and draw a straight line up the airframe.
- Make a mark approximately 1/4" in front of the FWD end of the motor can (this should be approximately 6.25" from the AFT end of the airframe).
- Drill a hole smaller than the screw so the screw threads into it
- Drop a small amount of epoxy in drilled hole
- Thread the rail guide and screw in the hole
- Rotate rocket 180 degrees and let cure.

### Optional Install:

You can install the launch lugs on the opposite side of the rocket, which will give you the option of launching from a rail or standard launch rod.

If installing launch lugs the procedure is as follows:

- Cut the launch lug in half at a 45 degree angle, making them aerodynamic.
- Find the high point of the airframe between fins.
- Mark a straight perpendicular line up 10" from the AFT of the airframe. With the angle pointed to the FWD end of the rocket, epoxy one lug 2" up from the AFT of the airframe.
- Epoxy another at least 8" FWD of the 2" mark. Allow to cure.
- Add epoxy fillets to each side of each lug. Allow to cure.

## STEP 6 - Shock Cords / Nosecone / Parachute Assembly



**A.** On FWD end of the Kevlar® cord coming from the MMC, tie a .5" loop. Take one end of elastic shock cord, pass it through the Kevlar loop and tie a double knot. Insert elastic cord into the slit in fire resistant blanket and slide the blanket down the cord.



**B.** On FWD end of the elastic shock cord, pass the shock cord through the loop in the cone. Tie a double knot 12-18" from end securing cone in place.



**C.** At the end of the shock cord tie a double knot onto the recovery swivel. Pass parachute shroud lines through other end of swivel, pass parachute through shroud lines, and pull tight.



The complete recovery system

### **LOC PRO Build Tip!**

Use a small quick link to attach the Kevlar and elastic shock cords. This will aid in making fast "swap-outs" of different Modular Motor Cans (MMC).



Small Quick Link makes MMC swap-outs fast!

## STEP 7 - Paint / Finish

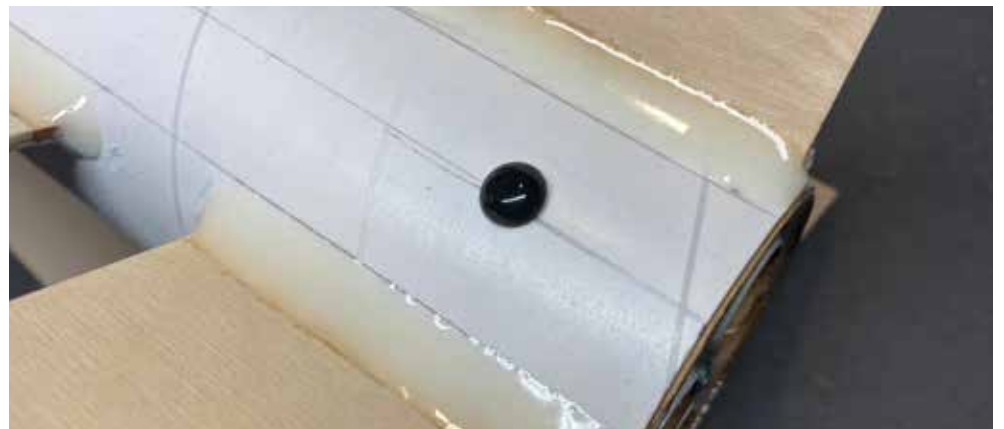
Lightly sand plastic nose cone with fine sandpaper to remove molding seam line. Also sand airframe and fins to produce a smooth finish. Fill airframe spirals if you

choose. Another proven method is to prime the rocket, sand, prime/sand — repeat. Filler primer is popular, used in this process. Repeat until a smooth surface is obtained.

Paint rocket with paint of choice. Apply vinyl decals to your liking. Apply a protective clear coat to the finished model.

## STEP 8 - Modular Motor Can Assembly to Airframe

Insert Motor Can and secure with plastic rivets.



## Swap-Out Your MMC for More Flying Fun!

Your LOC Precision 2.56" MMC Compatible kits can be outfitted with different Modular Motor Can configurations. [Click here for more information!](#)

**NOTE: Other MMC configs may require modifications to the rocket to ensure stability!  
IE: nose weight to be added.**

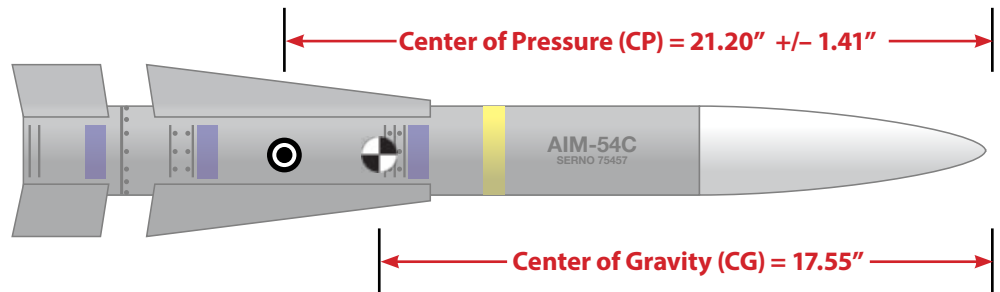


## PREFLIGHT

### Sim Your Rocket!

This rocket is recommended for low to intro mid power rocket motors 4xB — 1xE impulse. Depending on your flying field and finished weight, this is a very versatile kit. 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.

**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.**



### Phoenix MMC Specs

Height: 29.00"  
Weight: 16.00 oz.\*  
Diameter: 2.630"  
CG: 17.5530" from nosecone tip  
CP: 21.2062" (+- 1.41")

*\* Be sure to weigh your rocket!  
Your build may be above or below the specified weight. The actual weight must be entered into the sim software to get correct flight statistics.*

### Motor Suggestions

Motor	Number of Motors	Altitude in Feet
B6-4	4	175
C6-5	4	550
C12-6	4	725
D16-4	2	400
D13W-7	2	725
D-16-8	4	990
D12-7	3	950
E15W-4	1	750



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## Model Rocket Safety Code

**Materials** – I will use only lightweight, non-metal parts for the nose, body, and fins of my rocket.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**Recovery Safety** – I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places.

## Launch Site Dimensions

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 G's	1,500'

## Schools, Clubs and Other Groups

Loc Precision Multi-Packs are available for this and other Loc Precision Rocket kits. Call or email us for multi-pack pricing.



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