

DUAL DEPLOYMENT

For Recovery



What is Dual Deployment Recovery?

High power rocket recovery systems are either single or dual deployment.

Single deployment recovery means that at apogee, an event occurs (an ejection charge fires), the rocket separates and a main parachute is deployed.

Dual deployment recovery means that at apogee, a first event/ejection charge occurs, the rocket separates and a small drogue parachute is deployed. The rocket then free falls to a preset altitude that is closer to the ground. Then a second event/ejection charge occurs, and the main parachute is deployed. The main parachute then slows the rocket down to a slower, safe landing speed.

Why Use Dual Deployment Recovery?

Dual deployment recovery systems keep drift to a minimum, which is useful on small launch fields or launch fields surrounded by forests, irrigation ditches or other hazards. Dual deployment is also useful on rockets that will reach high altitudes.

Dual deployment is usually found on launch fields on the eastern/southern coasts. The western USA usually has wide open areas to launch, and dual deployment is rarely needed.

Can Any Rocket Use Dual Deployment Recovery?

Most high and mid power rockets can use dual deployment. You can include dual deployment (DD) in a new build, or convert/retrofit a completed rocket into dual deployment.

Will These Instructions Show Me Exactly How To Make A Dual Deployment Recovery System?

Yes. And no.

As with many aspects of the rocketry hobby, there are many ways to accomplish a goal. What works for one build may not be the ideal solution for a different build. Everyone has their own way of getting the job done.

What this guide will do is present one way of making a dual deployment system.

The best way to be successful is to get involved with a local club, ask questions of experienced members, observe what they have done, and apply the knowledge to your build.

These instructions will walk you through the steps of retrofitting DD into a completed build.

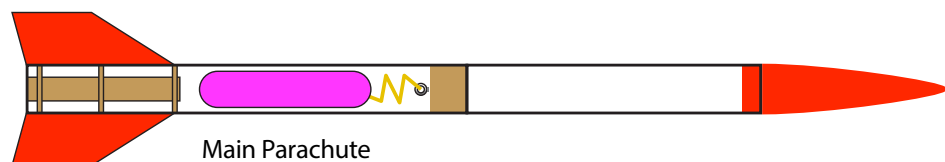
As always, if you have questions, feel free to [contact Loc/PML](#). We will do our best to help you.

What Basic Parts and Components are Needed to Build a Dual Deployment System?

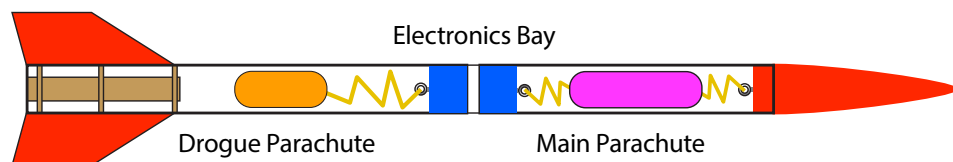
The list below shows parts for a basic system. The parts are clickable links to the Loc website where applicable.

- [Payload Bay Airframe](#)
- [Electronic/Altimeter Bay](#)
- [Altimeter](#)
- [Altimeter Switch](#)
- Battery Power
- Wire - 20 gauge
- Zip Ties
- [Recovery Harnesses](#)
- [Black Powder Charge Cups](#)
- [Shear Pins](#)
- [Screws or Rivets](#)
- [CA Glue and Epoxy](#)

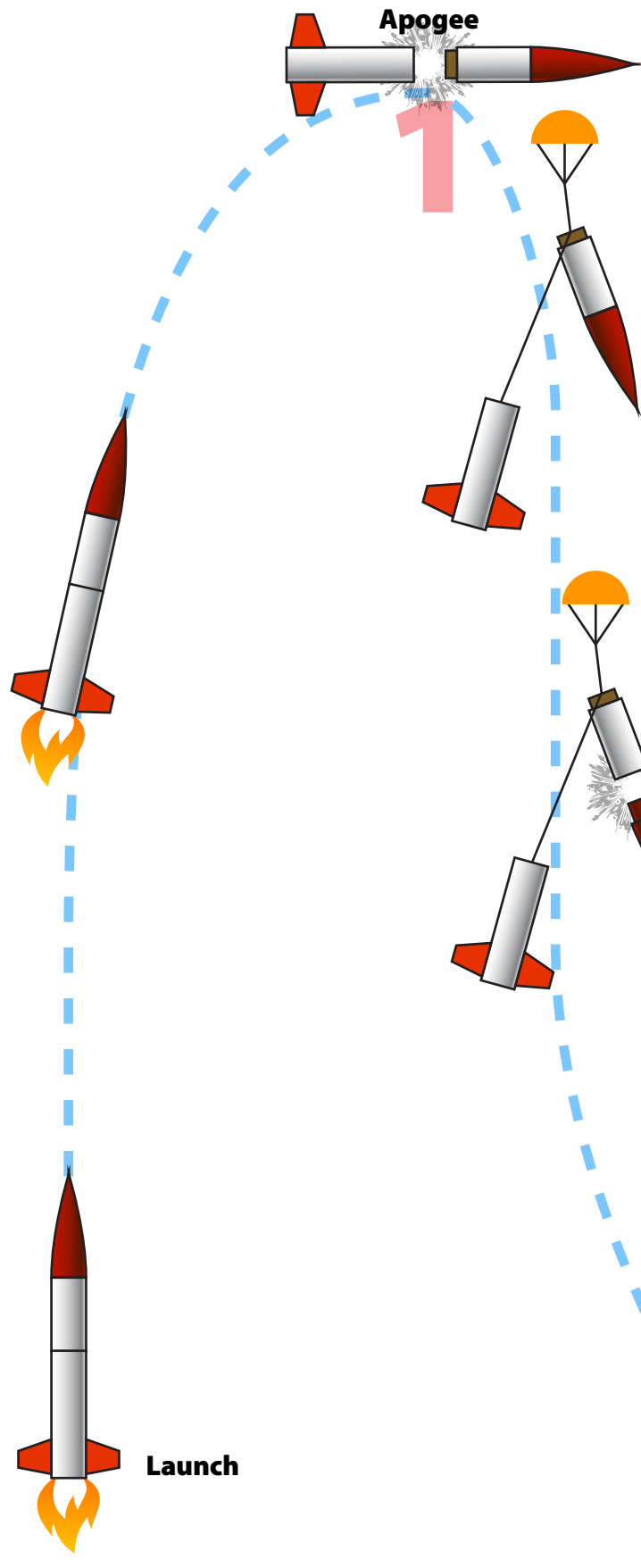
Single Deployment



Dual Deployment



Dual Deployment Recovery



First Event – At apogee, a charge fires and deploys small drogue parachute.
The drogue is usually contained in the booster section of the airframe.

With drogue chute deployed, rocket falls on a “near vertical” path, keeping the rocket near the launch site.

Second Event – At a preset altitude a second charge fires and deploys the main parachute.
The main is usually contained in the payload section of the airframe.

With the main parachute deployed, the rocket slows to a safe landing speed, and touches down close to the launch site.

Loc Ebay Components

10-24 hardware used on EB-2.14 and EB-2.56.

1/4" x 20 hardware used on all other models.

Electronics sled

Stiffy™ Tube Coupler

1" long LOC Body Tube

Payload Extension

10-24 THD Rods on EB-2.14
and EB-2.56. 1/4" x 20 THD
Rods on all other models.

Assembled view .
Available diameters
are 2.56, 3.0 and
3.90.

Catalog Numbers:

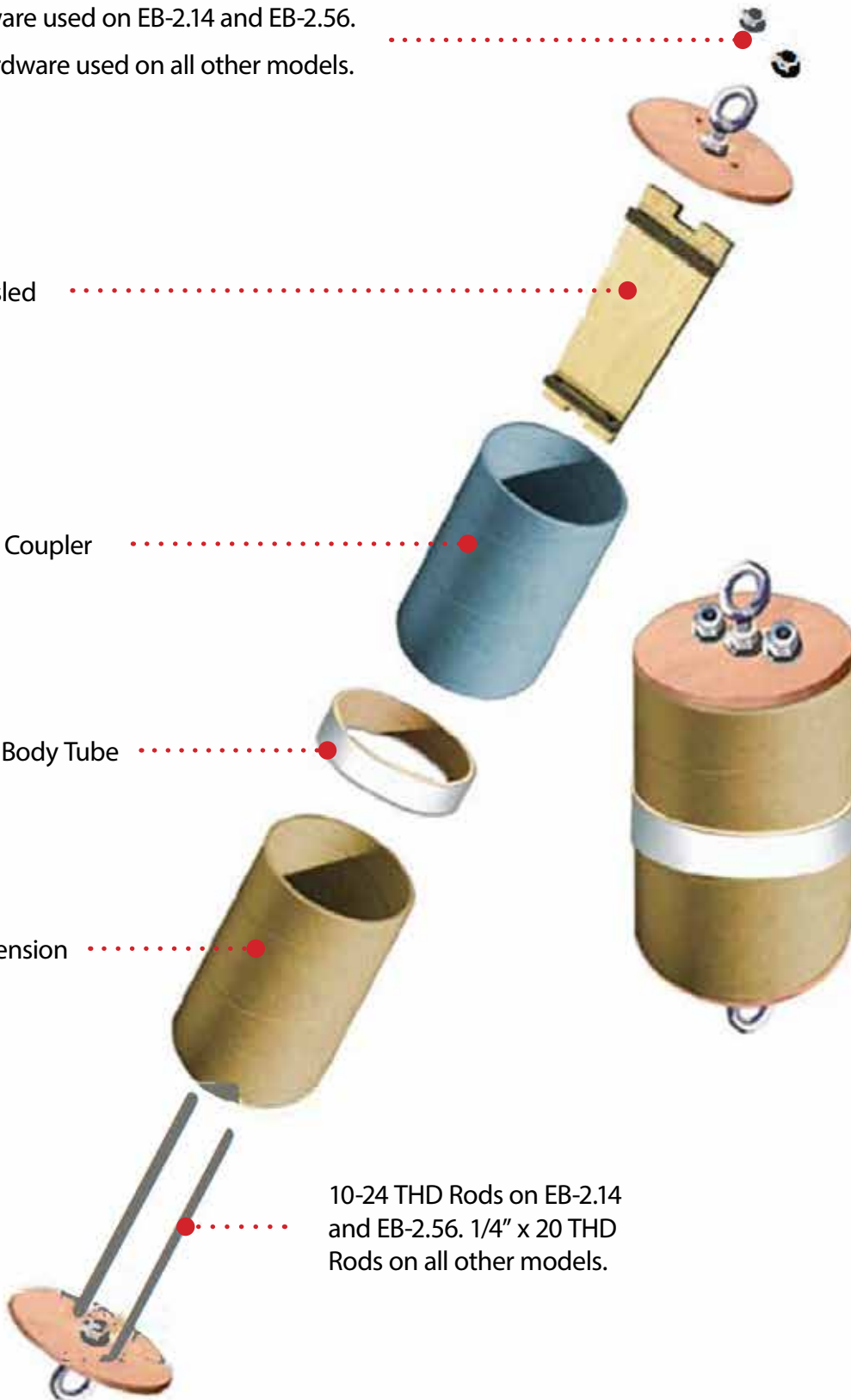
EB-2.56

EB-3.0

EB-3.0L

EB-3.90

EB-3.90L



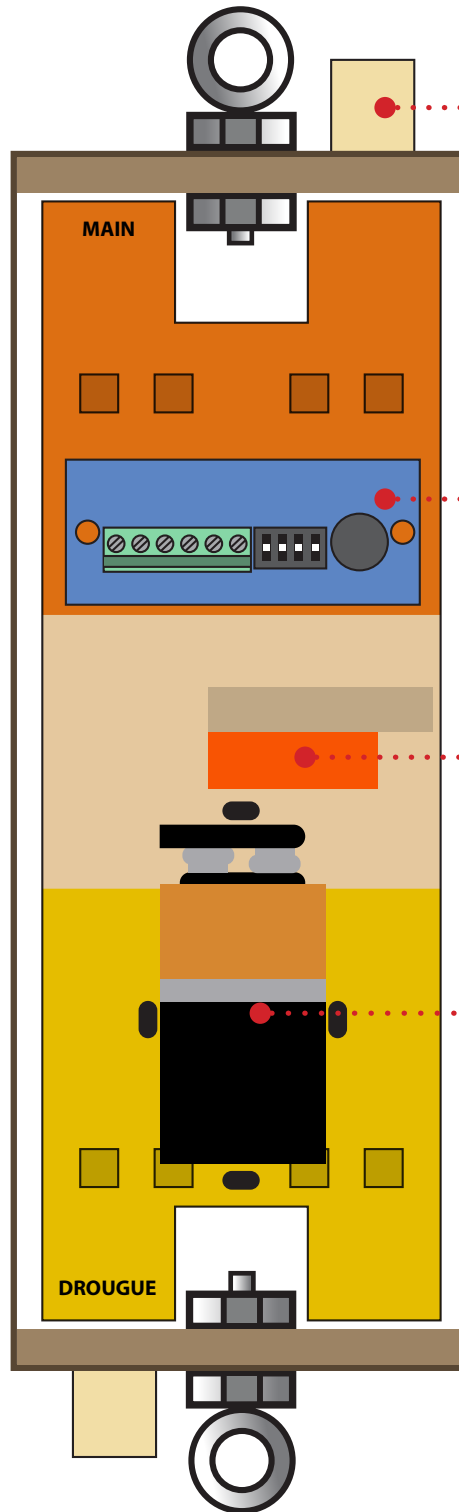
Electronics Sled

Before you build the electronics bay...

...plan how your electronics are going to be positioned on the electronics sled.

A basic dual deployment systems is comprised of the following components:

- Altimeter
- Switch
- Power source
- Charge containers
- Wiring



Charge Container

Charge containers could be centrifuge tubes, rubber glove finger tip, PVC caps, metal tubes, cardboard tubes, or manufactured charge containers

Altimeter

There are a variety of altimeters available. Make sure your choice allows for at least two events; more is a plus. Click [here](#) to see the Loc Precision altimeters.

On/Off Switch

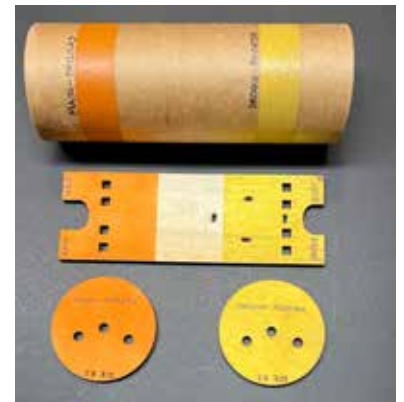
You need a way to quickly turn on or cut the power to your altimeter. If something goes amiss on the launch pad, you don't want to have to disassemble your rocket and electronics bay to disarm the charges. *Safety is key!*

Power Source

The power source can be a simple, tried and true 9V battery. Or upgrade to a LiPo battery. The choice is yours.

Dual Deployment Failures

Most dual deployment failures can be attributed to two scenarios. The first is wiring that comes loose at some point during the launch/recovery process. The second is "In-a-hurry-itis"! You rush some part of the pre-launch process. One mistake is that the ebay gets inserted into the airframe in the wrong direction, ie, the drogue charge gets inserted into the payload where the main chute resides. To make certain the ebay gets inserted properly, color code the components. In this case, yellow is the drogue/booster side, and orange is the main/payload side. You can use whatever colors you choose. It's just another way to work success into your pre-launch checklist.



EBay Assembly

Stiffy™ and Coupler Tube Assembly

Center the Stiffy™ tube coupler stiffener into the Tube Coupler and epoxy in place. This placement will allow for the wooden Bulkhead Plates to extend approximately 1 /32 inch beyond each end of the Tube Coupler for strength and forms a seal to the outside area.

Make sure you hold this assembly still and have each end of the STIFFY™ equally recessed into the coupler tube. When the epoxy has setup, lay this assembly on its side to cure for 10 minutes.

WARNING: It is critical that you wipe any epoxy off the end of the STIFFY tube where the epoxy oozed out when you inserted the STIFFY inside the coupler tube.

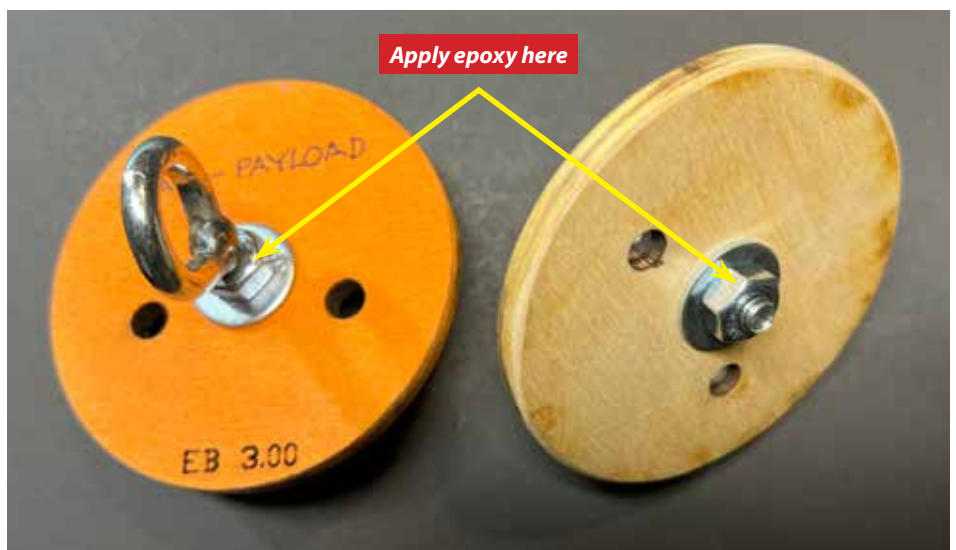
Once the Stiffy™ tube/coupler has cured, the optional 1" body tube switch band can be centered and epoxied into place on the coupler tube.



Bulk Plate / Eye Bolt Assembly

Thread a 1/4" nut all the way down the threads of the eyebolt. Slip a fender washer up to the 1/4" nut and then insert the eyebolt/nut/washer assembly through the center hole of the bulkhead end plate. Slide a fender washer onto the threads, followed by another 1/4" nut. Make sure the eye bolt is centered in the end plate hole, and tighten the 1/4" nut. Repeat this process for the second bulk head end plate.

When completed, mix a batch of epoxy and epoxy the nut/washer/thread assemblies, then set aside to cure.



Threaded Rod Assembly

(NOTE: The following step is performed on both threaded rods.)

A. For this step, you will need two 7/16" wrenches. Thread two nuts approximately 1" down the threaded rod. Using two 7/16" wrenches, lock these nuts into place by tightening them against each other.

Now take a nylon insert lock nut and thread it on the end of the threaded rod until approximately 1/8" of the threads show though the nylon lock nut end. Use the two 7/16" wrenches to accomplish this; one wrench will be on the nylon lock nut, the second wrench will be on the two nuts about 1" down the rod.

Repeat this with the other threaded rod.

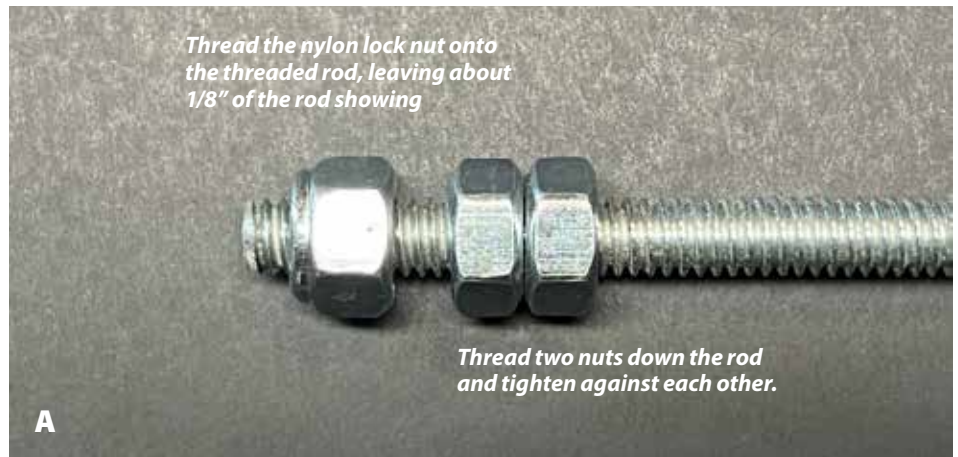
When the nylon lock nuts are in place, remove the two 1/4" nuts and set them aside. (You may need to use the two 7/16" wrenches to separate the nuts.)

B. Take a 1/4" washer and slide it down the threaded rod, placing it against the nylon lock nut. Insert this assembly through one of the two holes in the bulk head end plate.

C. Slide a 1/4" washer down the threaded rod to the bulk plate, followed by a 1" nut. Tighten the nut on the inside of the bulk plate.

Repeat for the second threaded rod.

Image **D** shows the completed assembly.



Electronic Sled Assembly

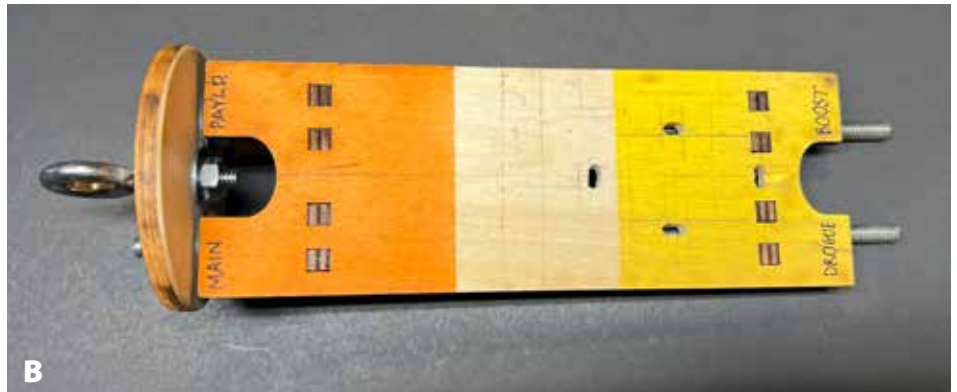
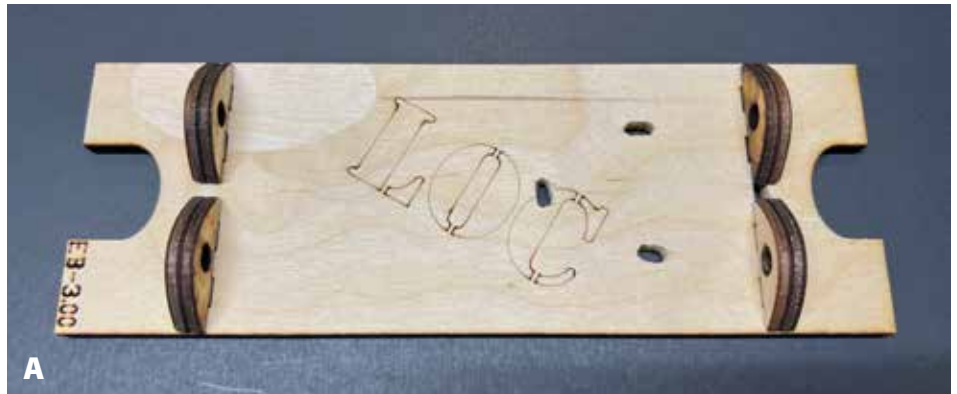
A. Assemble the Electronics Sled by epoxying the launch lugs into the precut laser holes provided.

B. Test fit the Electronics Sled on the threaded rods and make any adjustments as needed.

C. Test fit the entire ebay assembly for proper fit.

D. Once you are completely satisfied with the fit of your ebay assembly, mix a batch of epoxy and apply epoxy to the nut/washer/rod assembly where indicated.

Mount your electronic device according to manufacturer's specifications and add any ports if required.



Recovery System Assembly

Loc recommends assembling your recovery system components in the following manner.



Tie both FR Blankets onto the shock cord with a knot

Drill two holes into the nosecone and loop the shockcord through the holes. **DO NOT** use the plastic attachment point on the nose cone... **it will fail!**

Make a loop on the shock cord and attach a quick link to the loop and the av bay eye bolt

Make a loop knot to attach the shock cord to the eye bolt. For those kits that include a Y harness, attach the harness directly to the u-bolts.

