Cirrus

Assembly instructions

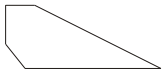
Please read and understand all instructions before continuing!

Stuff you will need:

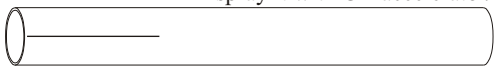
One set of each 5 and 20 minute epoxy
One sheet of each fine and medium sand paper
Ruler and pencil
Masking tape

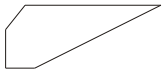
Step 1

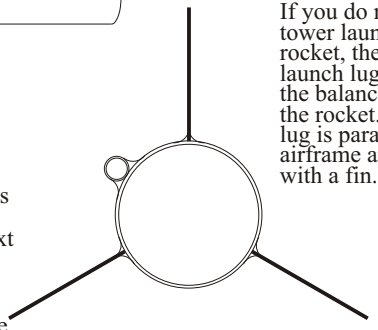
NOTE:
Be sure to scuff all parts to be bonded using medium sand paper.



1) Apply a bead of thick CA into a "dado" slot on the airframe. Push the fin into the slot. Make sure that the fin is perpendicular to the airfame. Use tape to hold the fin in position while the CA cures or spray it with CA accelerator. Repeat this process for all fins.







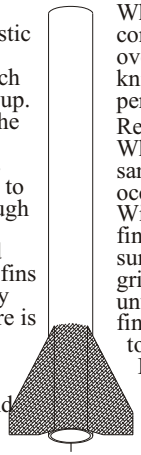
If you do not intend to tower launch this rocket, then epoxy the launch lug in place at the balancing point of the rocket. Be sure the lug is parallel to the airframe and not in line with a fin.

2) Apply an epoxy fillet to both sides of each fin. Carefully smooth the epoxy with your finger before it begins to gell. Allow the epoxy to set-up before rotating the rocket to do the next set of fins. Once the epoxy has fully cured, you should sand the fillet smooth with 150 grit sandpaper. Also sand all fin surfaces and the area of the airframe between the fins and 1 " above the fins using 220 grit sandpaper.

Step 2

Remove the fiberglass cloth from the plastic wrapper. Be very careful not to distort or fray the edges of the fabric. Mix up a batch of 20 minute finishing epoxy in a small cup. Using a 1" wide disposable brush, Coat the facing sides of two ajacent fins and the airframe between and 1/4" above the fins with the epoxy. Apply just enough epoxy to completely wet the surfaces, but not enough to run or sag.

Apply a piece of glass cloth to the coated surfaces. The cloth should over hang the fins on all sides. Press the cloth into the epoxy by dabbing it with the brush. Be sure there is no air trapped under the cloth. The cloth becomes transparent when it is properly wetted with epoxy. If some areas do not appear wet, dip the brush in the epoxy and dab the dry area.

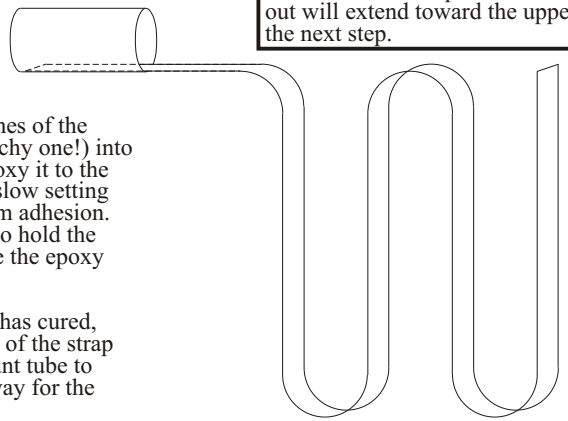


When the epoxy has set firm, but not completely cured, trim the overhanging cloth with an E-Acto knife. Don't worry about making it perfect at this point.

Repeat this process on all three sides. When the epoxy has completely cured, sand off any bumps that may have occured using 150 grit sandpaper. Wipe clean and apply another coat of finishing epoxy to the entire fiberglass surface. When cured, sand with 220 grit sandpaper. Repeat if necessary until smooth. Sand the edges of the fins smooth and round. Apply thin CA to all the edges of the fins and cloth. Fill any imperfections with spot putty or other filler. Allow to cure, then sand again lightly using 320 grit sandpaper.

Step 3

The end of the coupler with the strap sticking out will extend toward the upper airframe in the next step.

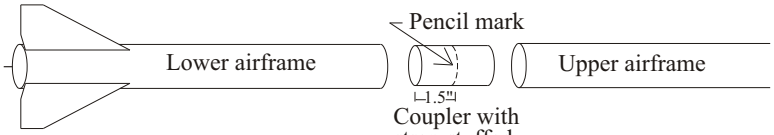


1) Pull about 3 inches of the strap (the non-stretchy one!) into the coupler and epoxy it to the inside wall. Use a slow setting epoxy for maximum adhesion. Use masking tape to hold the strap in place while the epoxy cures.

2) After the epoxy has cured, stuff the remainder of the strap into the motor mount tube to keep it out of the way for the next few steps.

Step 4

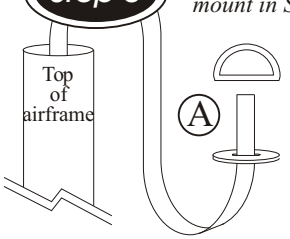
Draw a pencil mark around the coupler 1.5" from the end opposite the protruding strap. Spread some epoxy inside the lower airframe to a depth of about 1". Push the coupler into the lower airframe to the line. Do not allow epoxy to run down the inside of the airframe or into the coupler. Allow the epoxy to set. Then spread some epoxy inside the upper airframe to a depth of about 1". Push the upper airframe over the coupler protruding from the lower airframe. Do not allow epoxy to run into the coupler tube or onto the strap stuffed inside. Allow the epoxy to set.



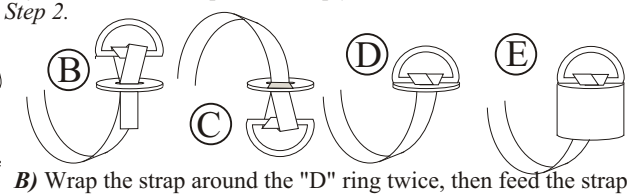
Be sure the combined airframe remains straight while the epoxy cures!

Step 5

The strap referred to in this step is the strap you installed on the motor mount in Step 2.



A) Pull the free end of the strap through the slot in the piston bulk plate. Slip the metal "D" ring over the strap.



B) Wrap the strap around the "D" ring twice, then feed the strap back through the slot.

C) Flip the assembly over. Fold the short end of the strap flat against the bulkplate and epoxy in place.

D) When the epoxy has cured, pull the strap until the "D" ring is wedged at the slot. Apply epoxy to the strap at the "D" ring.

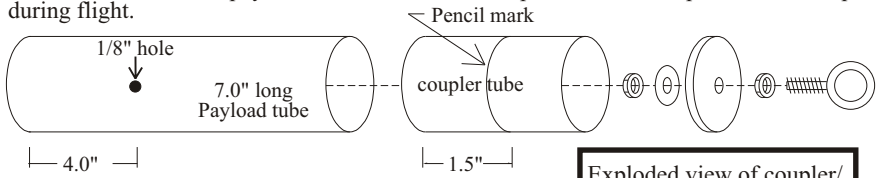
E) Epoxy the bulkplate inside the piston body 1/8" from the top. Apply an epoxy fillet to both sides of the bulkplate.

Step 6

Screw a nut onto the eye bolt. Thread the eye bolt through the hole in the coupler bulkplate. Place the washer over the eye bolt threads protruding through the bulkplate. Tighten the other nut against the washer. Apply a drop of CA to the threads of the eyebolt to keep the nuts from loosening.

Epoxy the bulkplate assembly inside the coupler tube about 1/8" from the end. Apply an epoxy fillet to both sides of the bulkplate.

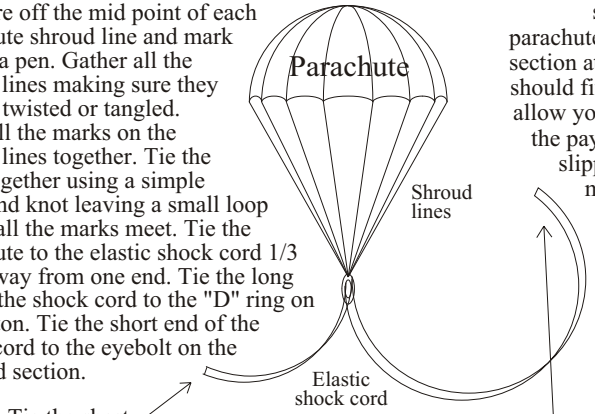
Draw a pencil mark around the coupler 1.5" from the end opposite the bulkplate. Spread some epoxy inside the payload section to a depth of about 1.0". Push the coupler into the payload section using a slow twisting motion up to the pencil mark.
Drill a 1/8" hole in the payload section 4" from the top to bleed off air pressure build-up during flight.



Exploded view of coupler/ bulkhead assembly

Step 7

Measure off the mid point of each parachute shroud line and mark it with a pen. Gather all the shroud lines making sure they are not twisted or tangled. Keep all the marks on the shroud lines together. Tie the lines together using a simple overhand knot leaving a small loop where all the marks meet. Tie the parachute to the elastic shock cord 1/3 of the way from one end. Tie the long end of the shock cord to the "D" ring on the piston. Tie the short end of the shock cord to the eyebolt on the payload section.



Tie the short end of the shock cord to the eye bolt on the payload section.

Pack the chute as directed in the parachute instructions.

Step 8

Slide the piston into the rocket followed by the shock cord and parachute. Place the payload section atop the rocket. It should fit just tight enough to allow you to lift the rocket by the payload section without it slipping off. Wrap masking tape around the shoulder of the payload section for a tighter fit if necessary. Now install the nosecone atop the rocket and secure it in place using small screws or rivets.

Tie the long end of the shock cord to the "D" ring on the piston.

NOTE:
When tying the shock cord to the parachute and the "D" ring, loop the shock cord through twice then tie a double overhand knot. Pull the knot tight and leave 2-3 inches of excess cord after the knot.

Now it's time to paint and detail your rocket!

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Cirrus Dart

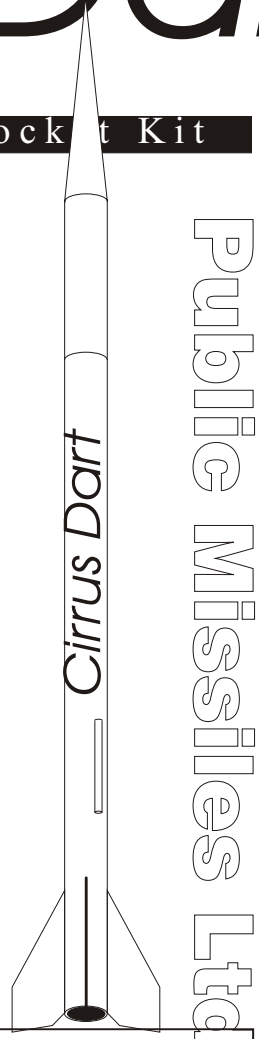
Public Missiles Ltd.

High Power Rocket Kit

The Cirrus kit contains all the parts necessary* to build a flying high power rocket:

1) Pre-slotted main airframe
1) Upper airframe
1) Payload section kit including:
    1) 7" long payload tube
    1) coupler tube
    1) bulk plate
    1) eyebolt
    2) machine nuts
    1) washer
1) Nose cone
3) Main fins
1) Piston ejection kit including:
    1) Piston body
    1) Piston strap
    1) Slotted bulk plate
    1) Metal "D" ring
1) Parachute
1) Coupler tube
1) Set fiberglass cloth
1) Elastic shock cord
1) 1/4" launch lugs
1) Decal sheet
1) Instruction sheet (this one!)

**Epoxy, paint, and motor not included.*



The center of pressure (CP) of this rocket is 35 inches from nose tip. After finishing your rocket, permanently mark the center of pressure on the airframe. CP Calculations were made using RockSim 4.0 program for subsonic flights. After loading the rocket with a motor, make sure that the center of gravity (balancing point) is at least 2.5" forward of the center of pressure mark. The center of gravity can be moved forward by adding weight to the nose cone. The average finished weight of this model is 18 ozs. It is impossible to test every rocket with every motor configuration therefore, if you are unsure about motor selection for any rocket consult the motor manufacturer.