CP is 63.311" from the tip of the nosecone or 22.187" from aft end of the 54mm tail cone.

Colors: Azure Blue and White

GPS telemetry down link and a radio beacon are carried in the nosecone compartment

Parachute compartment

Altimeter bay

Hybrid motor section
FIN DIMENSIONS

Material: 0.125" thick G10 fiberglass sheet

Epoxy root edge of fin to central motor tube and reinforce joints with 8oz Kevlar strips.
Kevlar cloth 5.35" diameter by 0.030" thick. Overlaps motor tube OD by 1" all the way around and is bonded between B1 and the backing plate.

Coupler tube 9.625" long x 3.870" OD x 0.082" wall thickness phenolic tubing with two layers of 6 oz fiberglass cloth applied to the inside surface. Slotted to clear rail guide backer plate.

Body tube 16.625" long x 3.900" ID x 0.082" wall thickness phenolic tubing wrapped in two layers of 6 oz fiberglass cloth.

Motor tube 22.44" long x 3.225" ID x 0.082" wall thickness two layers Aeroliteve fiber carbon fiber (4'' OD Braided sleeving)

Build Sequence
1. Add rings and fins to motor tube.
2. Add rail guides and backer plates to body tube.
3. Slide body tube onto motor tube.
4. Mount bulkhead B1 to the top of the motor tube.
5. Slide coupler tube in place.

Close-up of hybrid motor vent system after assembly

Hybrid motor vent tube is a 1/4-20 x 1.5" nylon hex head set screw. Drill set screw lengthwise with 1/16". Countersink left end 0.5" with 1/8" drill as shown below.

Cut-away side view of set screw

1.25" x 1.25" wood spacer is bonded between the motor tube and body tube. A 1/4-20 threaded insert installed in the spacer provides threads for the nylon set screw. Vented nylon set screw to be installed by user after motor is installed.
Booster section with HyperTek K240 hybrid motor installed.

- 1285 NS total impulse
- 1787 g total weight
- 751 g propellant weight
- 1036 g burnout weight
Coldfire

All dimensions are in inches

<table>
<thead>
<tr>
<th>Project:</th>
<th>Removable altimeter bay module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rev: B</td>
<td></td>
</tr>
<tr>
<td>Date: Jan. 7, 2006</td>
<td>Vern Knowles <a href="http://www.ve">www.ve</a> mk.com</td>
</tr>
</tbody>
</table>

Threaded rod mounts to bulkhead B3 with 1/4-20 nuts and washers. Extra nut and washer mounts altimeter module to bulkhead B4 in the airframe.

Extra nut and washer mounts altimeter module to bulkhead B4 in the airframe.

Altimeter module assembled
(electronics not shown)

Silicone foam rubber gasket

U-bolt for parachute harness attachment.

Foam Gasket Details

Cross section

Plan View

Fire-retardant silicone foam rubber gasket with adhesive backing. McMaster-Carr part number 85925K403. 1/4" thick. Cut to 3.75" OD x 3.00" ID and adhere to bulkhead B2.

1/4-20 nut and washer

Phenolic tube 7.355" long x 2.980" OD 0.062" wall thickness

1/4-20 x 9.875" threaded rod

Centerline of altimeter vent holes at 1.554" from end of tube. Drill four holes 3/8" Ø spaced 90° around the circumference.

1x2 wood block

Altimeter mount.

Actual dimensions 0.75" x 1.5" x 6.5"

Drill 1/4" Ø thru entire length.

Drill 1/2" Ø x 0.375" deep on top end only.

Drill 1" Ø x 0.125" deep on top end only.

1/4-20 nut and washer

Silicone foam rubber gasket

McMaster-Carr P.N. 8896T104 SS 1/4"-20 U-Bolt, 1.00" ID

Print scale in Inches
Nosecone installs into the top end of the airframe body tube.

Add lock washer and coupler nut to the end of the threaded rod protruding from the top side of bulkhead B4. The coupler nut accepts the threaded rod from the nosecone and allows the nosecone to be screwed into place.

Altimeter module slides into the tubing inside the airframe. The threaded rod at the top of the altimeter module passes through bulkhead B4 and a washer and nut are applied to secure it.

Altimeter module installed into airframe

The altimeter module diameter is small enough to easily slide through the inside of the body tube without binding on the build-up of ejection charge residue.

Silicone foam rubber gasket compresses against CR5 and seals the altimeter from the ejection charge compartment.
5:1 Ogive, 3.9" diameter plastic "Pinnacle" nosecone from Giant Leap Rocketry. Modify by cutting a 3.00" Ø hole centered on the aft end.

Nosecone tubing

3.00" OD x 15.375" flexible phenolic tube
0.0625 wall thickness

Bulkhead B5

2.88" OD, 3/8" thick aircraft plywood with 1/4" Ø center hole

Nosecone retainer ring with 4-40 x 0.375" socket head machine screws and washers

Assembled nosecone. This will screw into the coupling nut on the threaded rod at the top of bulkhead B4

Material: Aluminum

Print scale in Inches

<table>
<thead>
<tr>
<th>Project: Coldfire</th>
<th>All dimensions are in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD scale: 1&quot; = 5&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Top View

3.63" OD

Drill thru and tap #4-40 threads
3 places
120° spacing,
centered on edge face

Ø 3.01" center hole

Drill thru and tap #4-40 threads
3 places
120° spacing
at 1.66" radius

Section A-A

0.50" 0.25"

Chamfer corner
1/16" at 45°

Material: Aluminum

Coldfire

All dimensions are in inches
CAD scale: 1" = 1"

Drawing: Nosecone retainer ring
Rev: B
Date: Jan. 7, 2006
Vern Knowles www.vek.com
J-B Weld the threaded thrust ring to the motor tube.

54mm motor mount threaded thrust ring

Spacer only needed for Aerotech and HyperTek motors. Not needed for AMW motors.

Aluminum tail cone screws into place.
Finish: black anodize

Three piece tailcone retainer assembly from Aero Pack Inc part number TRA5439PB
Cross-section

Drill thru with 9/64" diameter at 1.814" radius.
8 places, 45° spacing

Material: Aluminum
Drill and tap for #6-32 threads at 1.814" radius, 8 places, 45° spacing.

Material: Aluminum
Motor mount tube

Two centering rings, 1/4" thick aircraft plywood. Epoxy to motor tube.

2.152" ID x 9.250" flexible phenolic tube 0.0625 wall thickness

Centering ring dimensions

0.250"

Aluminum motor mount plate epoxied in place.

Reinforce tube and fillet with one wrap Kevlar cloth 2.125" wide by 0.030" thick. Overlap onto Aero Pack thrust ring


Material: aircraft plywood

Print scale in Inches

Coldfire

All dimensions are in inches

CAD scale: 1" = 2.5"

Project:

Drawing: Hybrid motor tube

Rev: B

Date: Jan. 7, 2006

Vern Knowles  www.vemk.com
Rail guide backer plate

Rail guide

PML rail guide LRL-10-2-2
Mount using two 6-32 x 0.5” flat head machine screws

Drill and tap for #6-32 threads
2 places

Rail Guide material: Urethane
Backer Plate Material: Aluminum

All dimensions are in inches
CAD scale: 1” = 1”
Centering Rings CR2, CR3, CR4

Material: aircraft plywood

ø 3.900" OD

ø 3.354" center hole

0.375"
Bulkhead B1

Section A-A

Material: aircraft plywood

Drill 13/32" Ø
Drill 1/4" Ø
2 places

ø 3.746" OD

0.750"
Bulkhead B2

Section A-A

Material: aircraft plywood
Bulkhead B3

Section A-A

ø 2.856" recessed edge
ø 2.980" OD

Drill 1/4" Ø

Material: aircraft plywood

Coldfire

Project: Coldfire
Drawing: Bulkhead B3
Rev: B

All dimensions are in inches
CAD scale: 1" = 1"

Print scale in Inches
Date: Jan. 7, 2006
Vern Knowles  www.verk.com
Bulkhead B4

Section A-A

ø 3.00" OD

ø 3.90" OD

Drill 9/32" Ø

Material: aircraft plywood