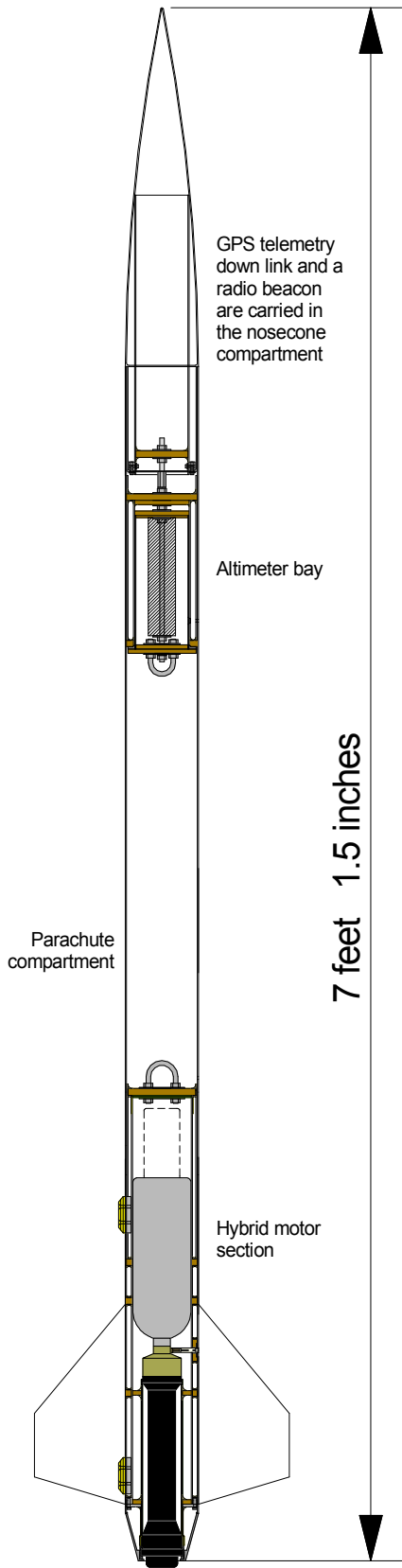
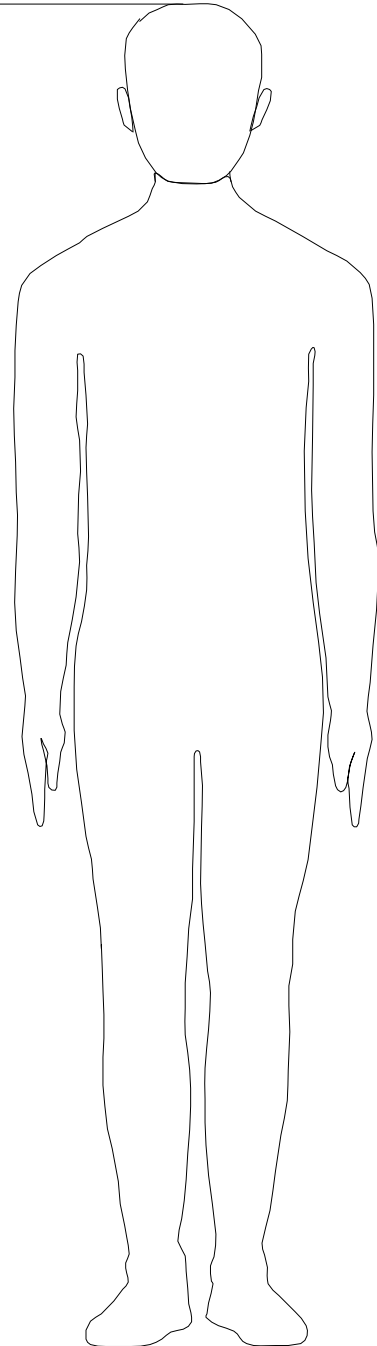


Colors:  
Azure Blue  
and  
White



7 feet 1.5 inches

5 feet 10 inches

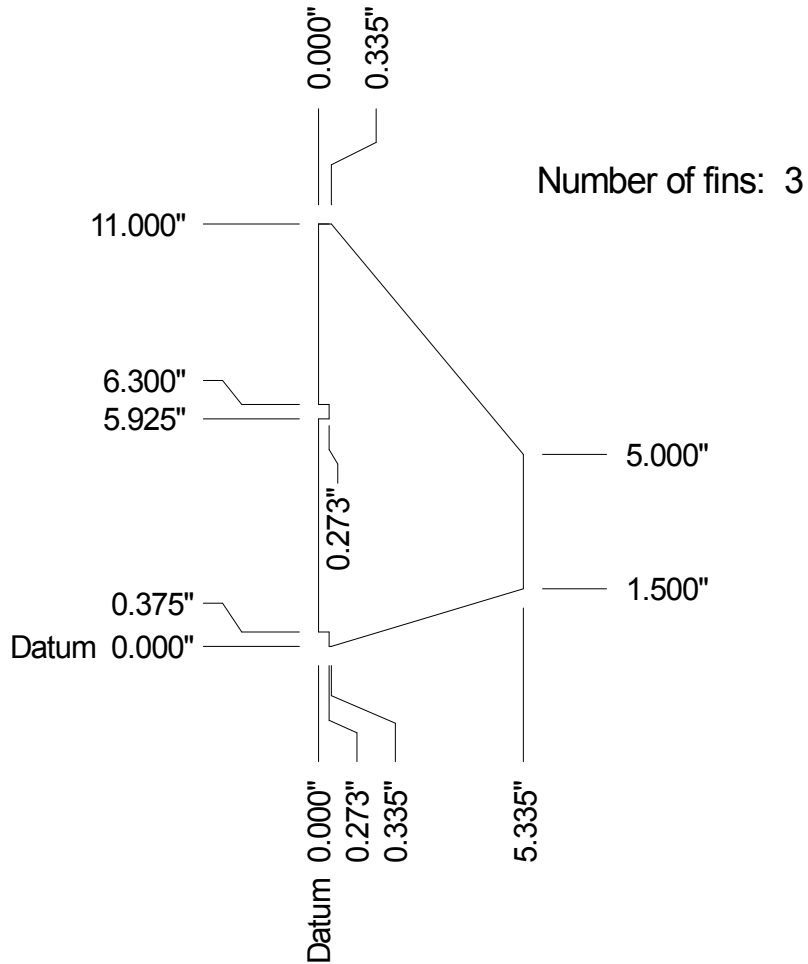


CP is 63.311" from the tip of the nosecone or  
22.187" from aft end of the 54mm tail cone.

Project:	All dimensions are in inches	
	CAD scale: 1" = 10"	
Drawing: COMPLETE AIRFRAME AND PAINT SCHEME	Rev: B	Date: Jan. 7, 2006
	By: Vern Knowles www.vernk.com	

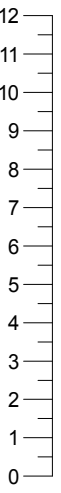
# Coldfire

# FIN DIMENSIONS



Material: 0.125" thick G10 fiberglass sheet

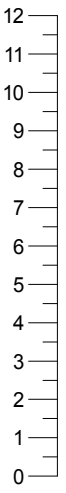
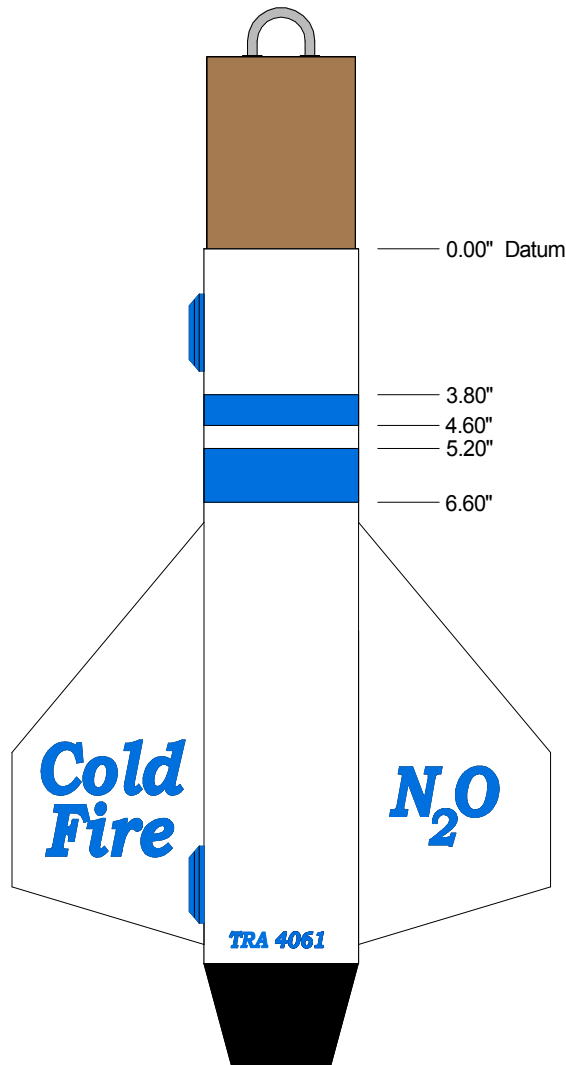
Epoxy root edge of fin to central motor tube and reinforce joints with 8oz Kevlar strips.



Print scale in Inches



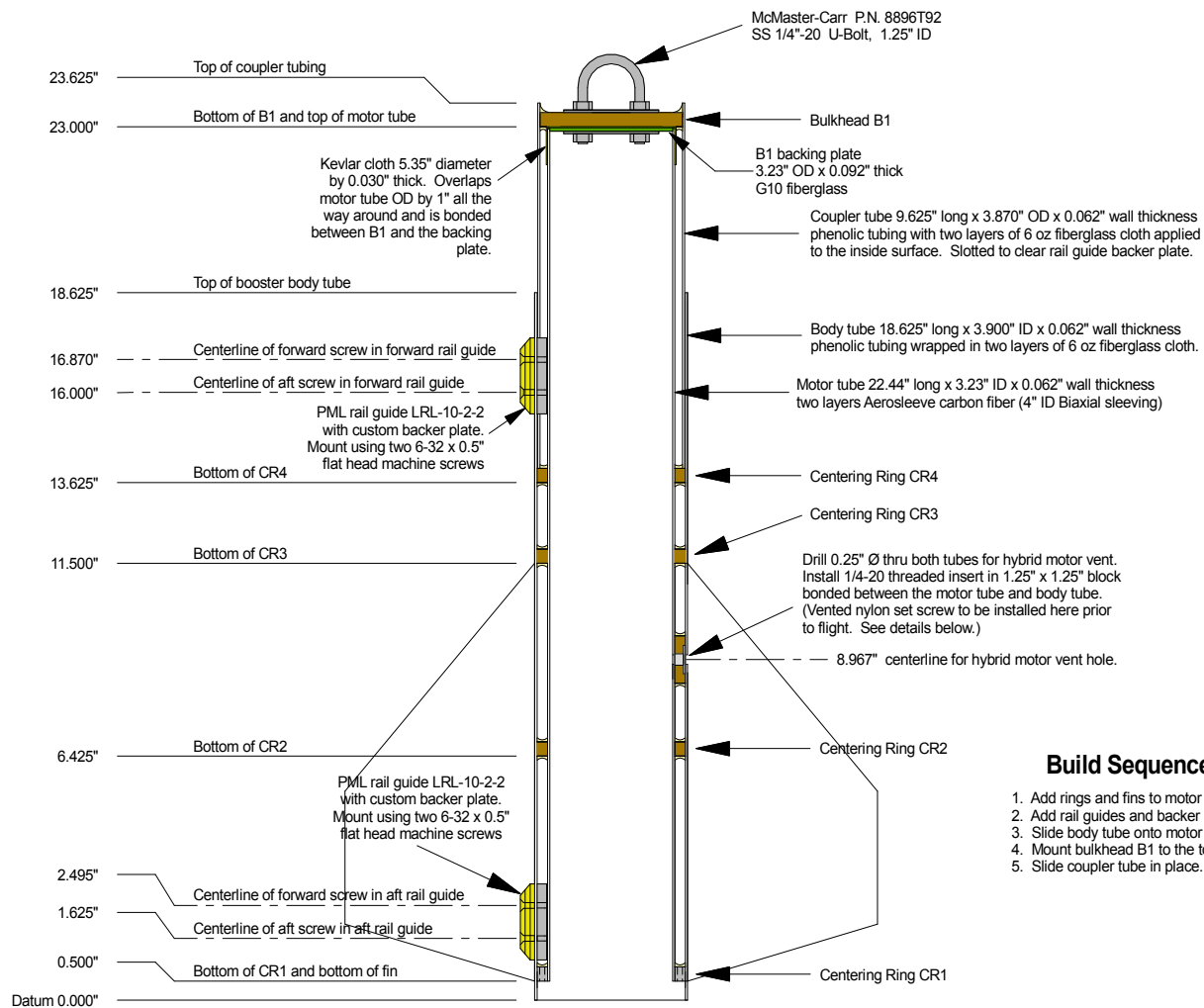
Project: <b>Coldfire</b>	All dimensions are in inches		
	CAD scale: 1" = 5"		
Drawing: Fin Dimensions	Rev: B	Date: Jan. 7, 2006	Vern Knowles www.vernk.com



Print scale in Inches



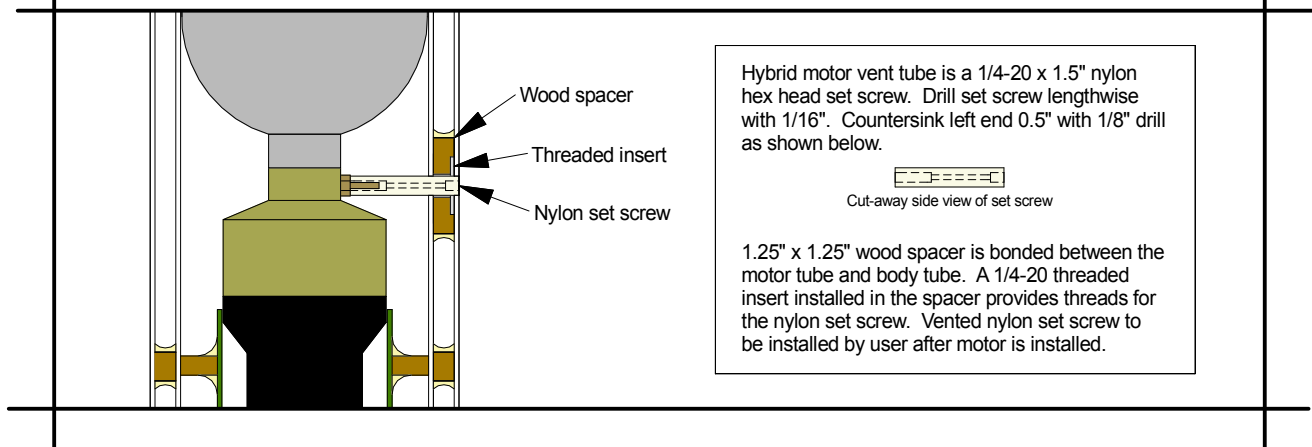
Project: <b>Coldfire</b>	All dimensions are in inches		Date: Jan. 7, 2006		Vern Knowles www.vernk.com	
	CAD scale: 1" = 5"					
Drawing: Booster Section External Finish	Rev: B					



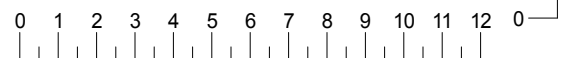
### Build Sequence

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.

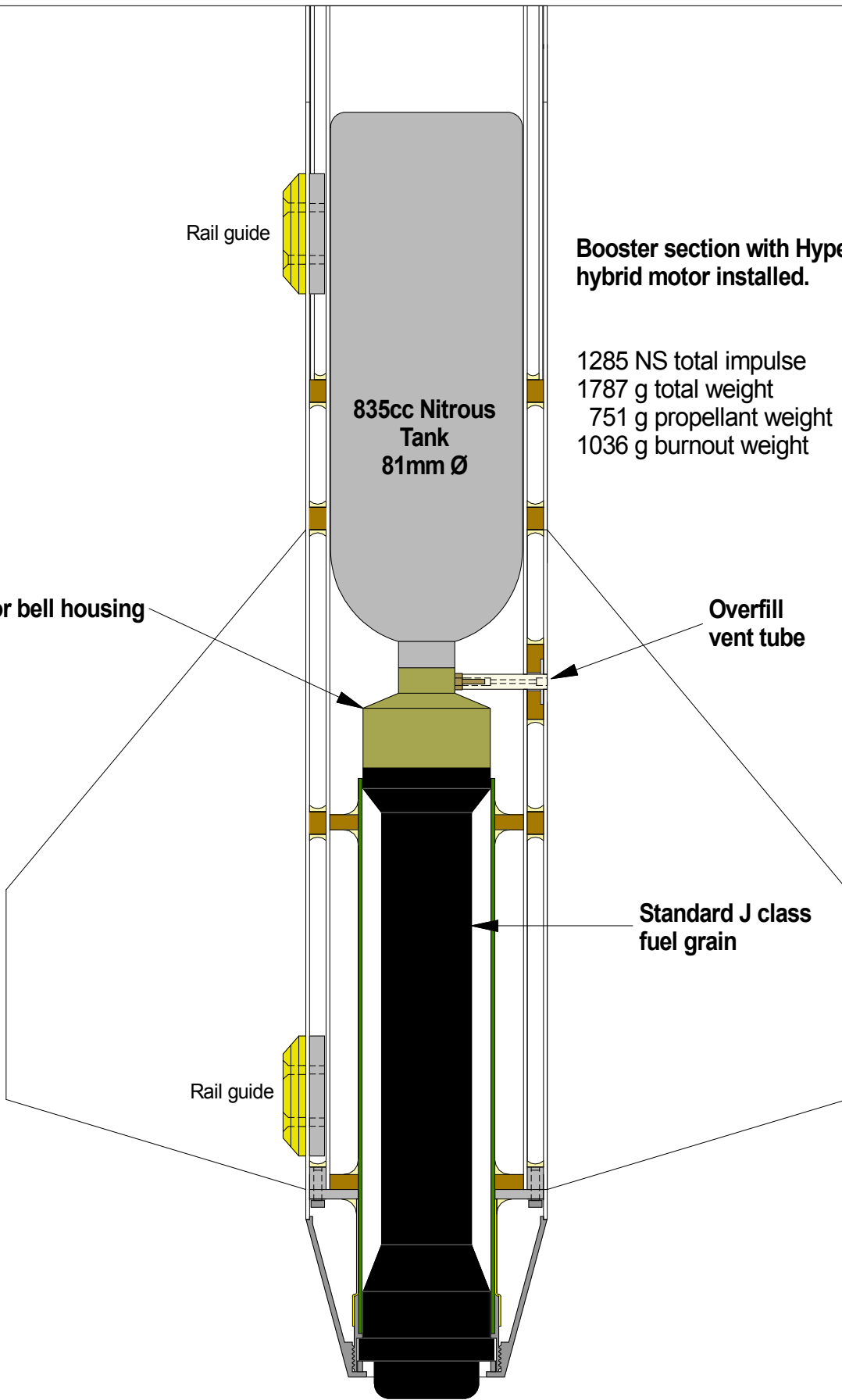
### Close-up of hybrid motor vent system after assembly



Print scale in Inches

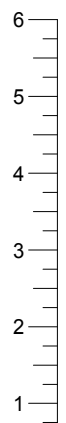


Project:	<b>Coldfire</b>	All dimensions are in inches
		CAD scale: 1" = 5"
Drawing: Booster Section Internal Construction	Rev: B	Date: Jan. 7, 2006

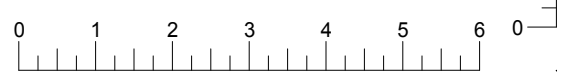


**Booster section with HyperTek K240 hybrid motor installed.**

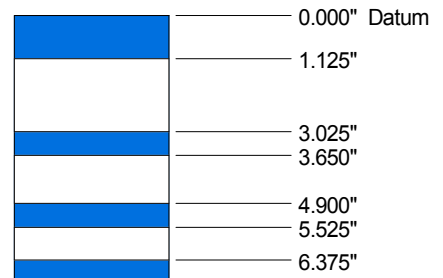
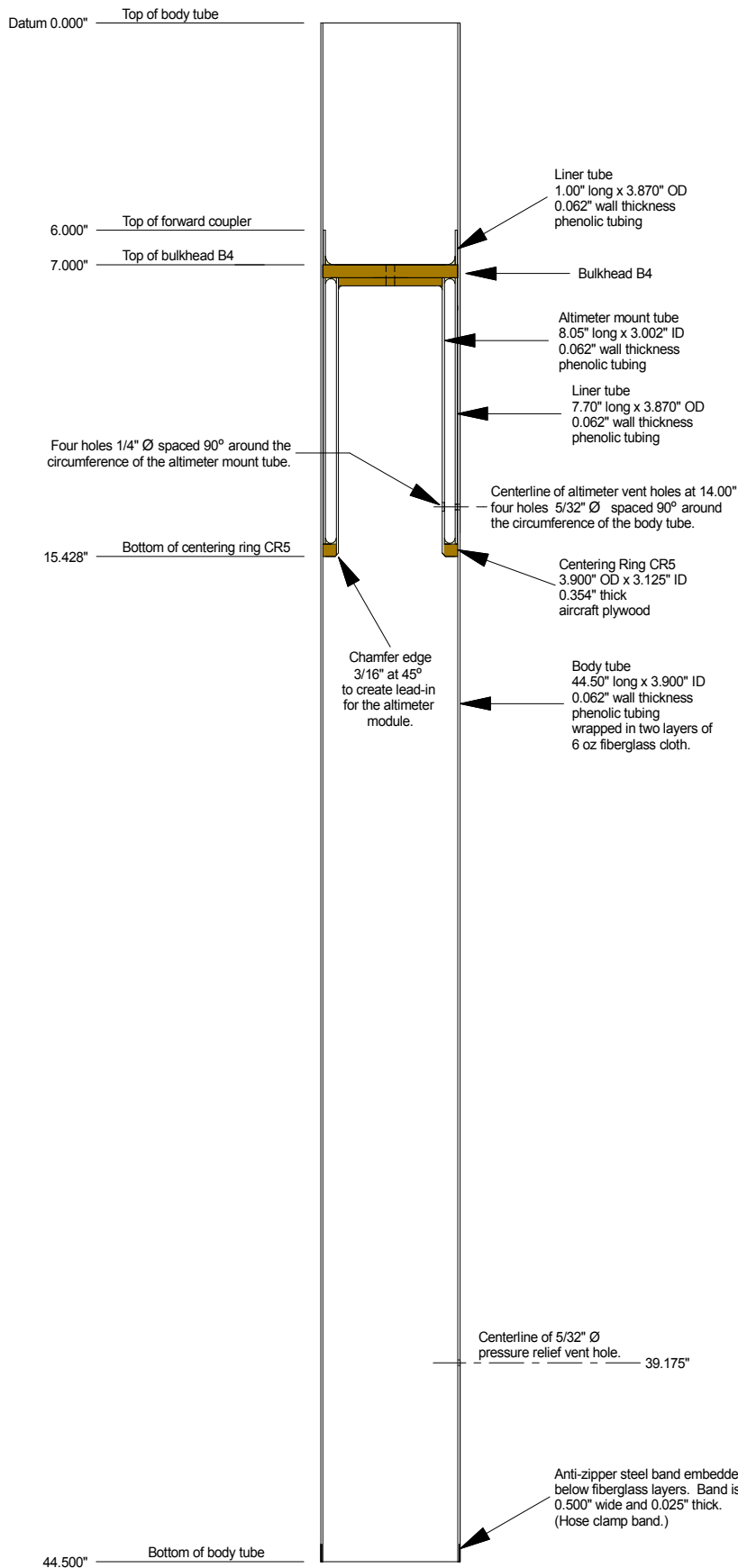
1285 NS total impulse  
1787 g total weight  
751 g propellant weight  
1036 g burnout weight



Print scale in Inches

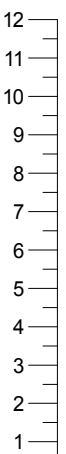


Project:	<b>Coldfire</b>	All dimensions are in inches	
		CAD scale: 1" = 2.5"	
Drawing:	HyperTek Hybrid motor installation	Rev:	B
		Date:	Jan. 7, 2006
			Vern Knowles www.vernk.com

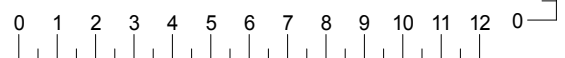


Paint scheme

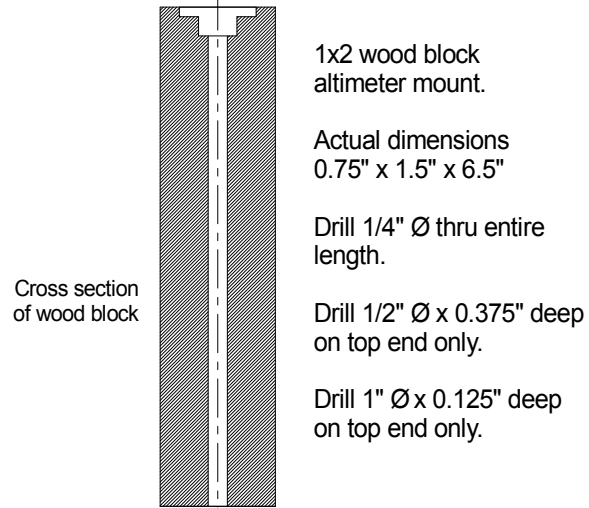
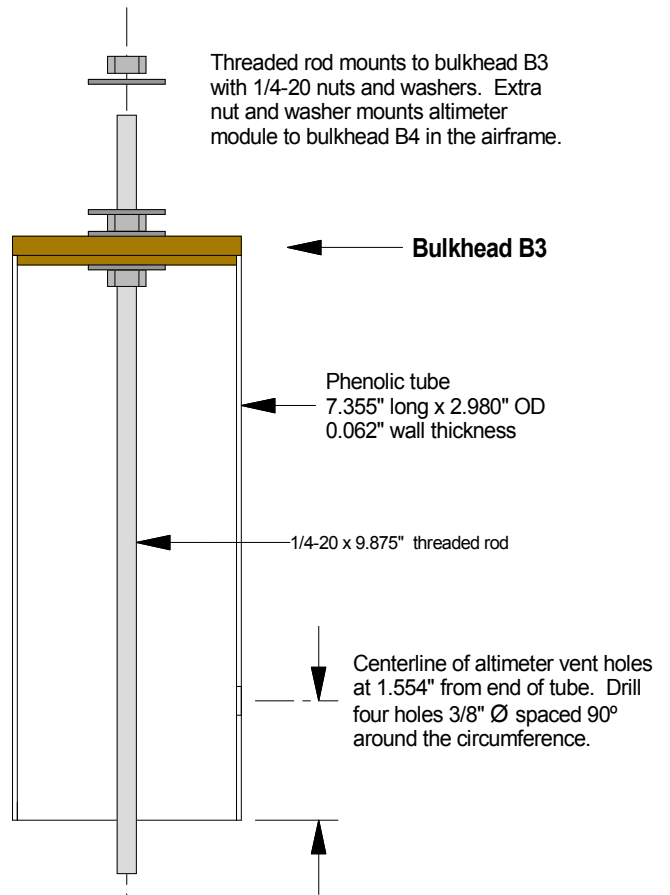
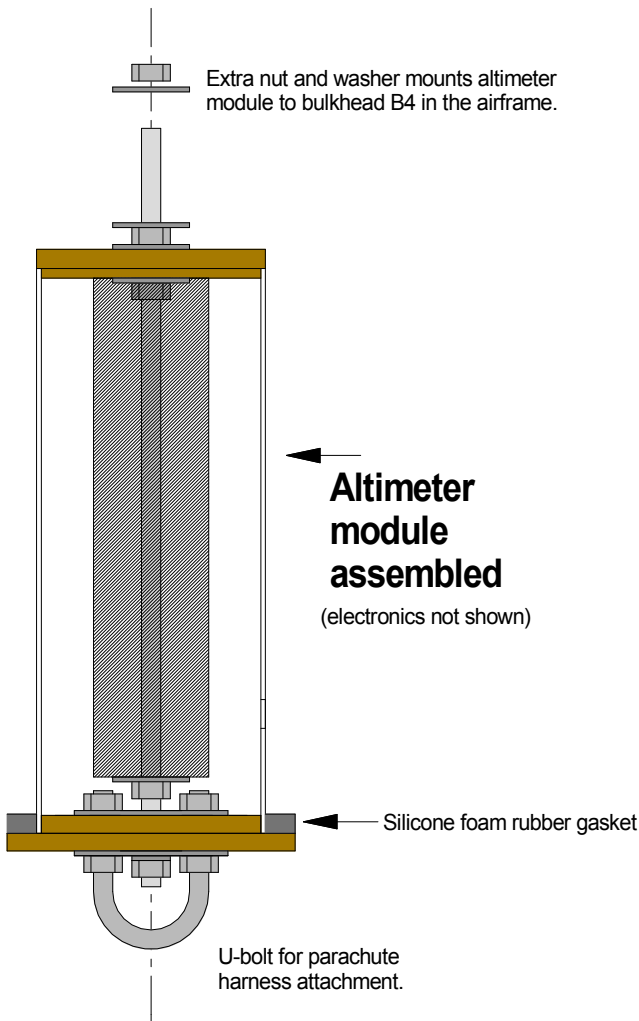
Colors:  
"BMW logo"  
blue and white



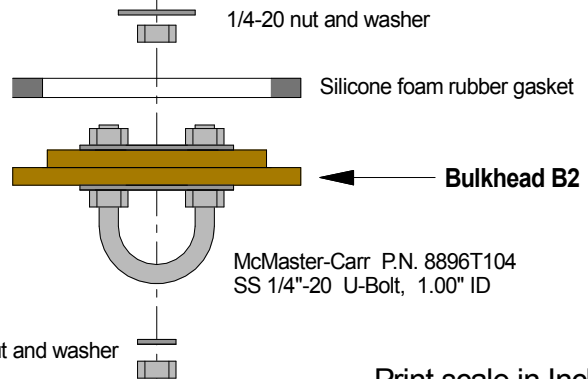
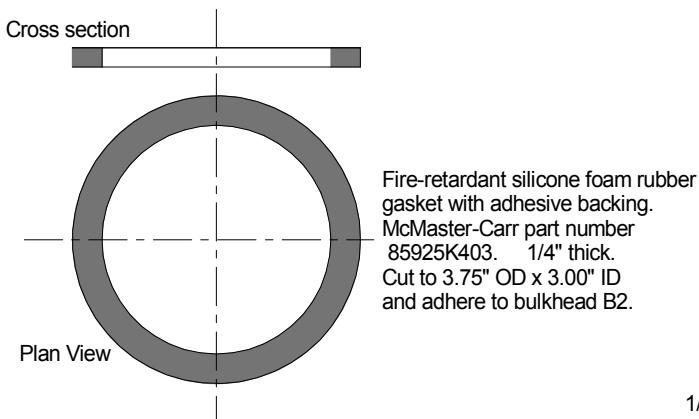
Print scale in Inches



Project:	<b>Coldfire</b>	All dimensions are in inches	
		CAD scale: 1" = 5"	
Drawing:	Airframe body tube construction	Rev:	B
		Date:	Jan. 7, 2006
			Vern Knowles www.vernk.com

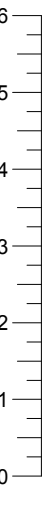


### Foam Gasket Details



1/4-20 nut and washer

Print scale in Inches



Project: **Coldfire**

All dimensions are in inches

CAD scale: 1" = 2.5"

Drawing: Removable altimeter bay module

Rev: B

Date: Jan. 7, 2006

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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.

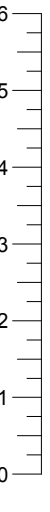
Silicone foam rubber gasket compresses against CR5 and seals the altimeter from the ejection charge compartment.

Bulkhead B4

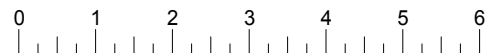
Bulkhead B3

Centering Ring CR5

Bulkhead B2



Print scale in Inches



Project: **Coldfire**

All dimensions are in inches

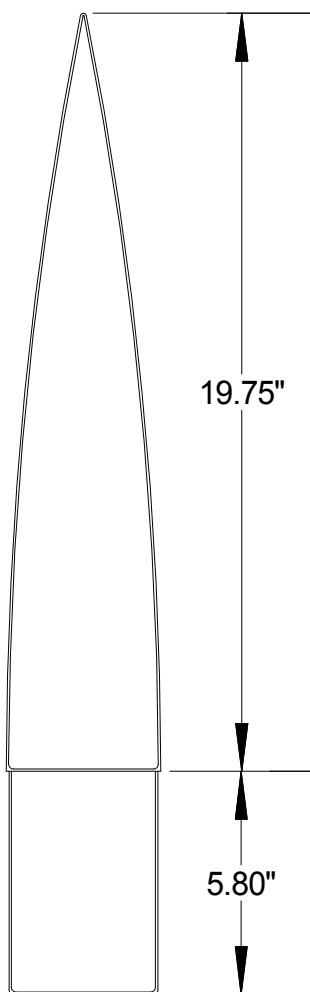
CAD scale: 1" = 2.5"

Drawing: Altimeter bay installation

Rev: B

Date: Jan. 7, 2006

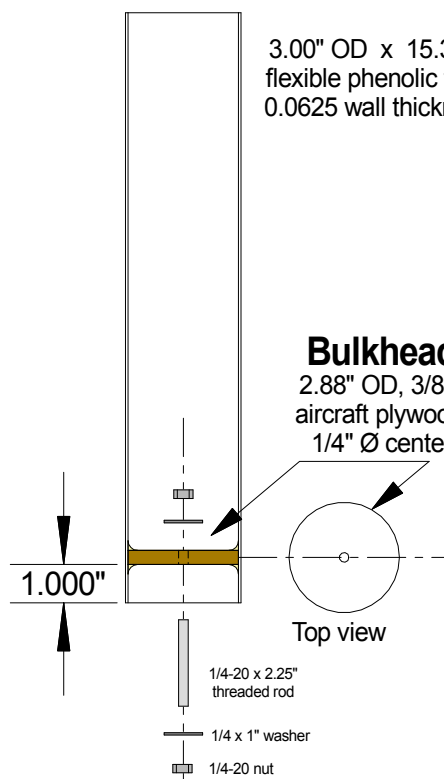
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5:1 Ogive, 3.9" diameter plastic "Pinnacle" nosecone from Giant Leap Rocketry. Modify by cutting a 3.00"  $\varnothing$  hole centered on the aft end.

**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"  $\varnothing$  center hole

Top view



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

Top view

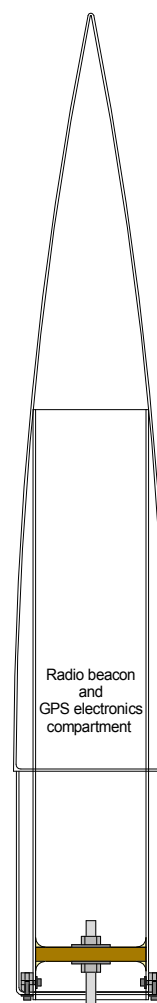
Cross section

Side view

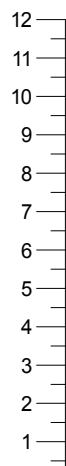
Bottom view

Nosecone retainer ring dimensions on next page.

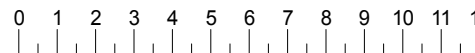
Material: Aluminum



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

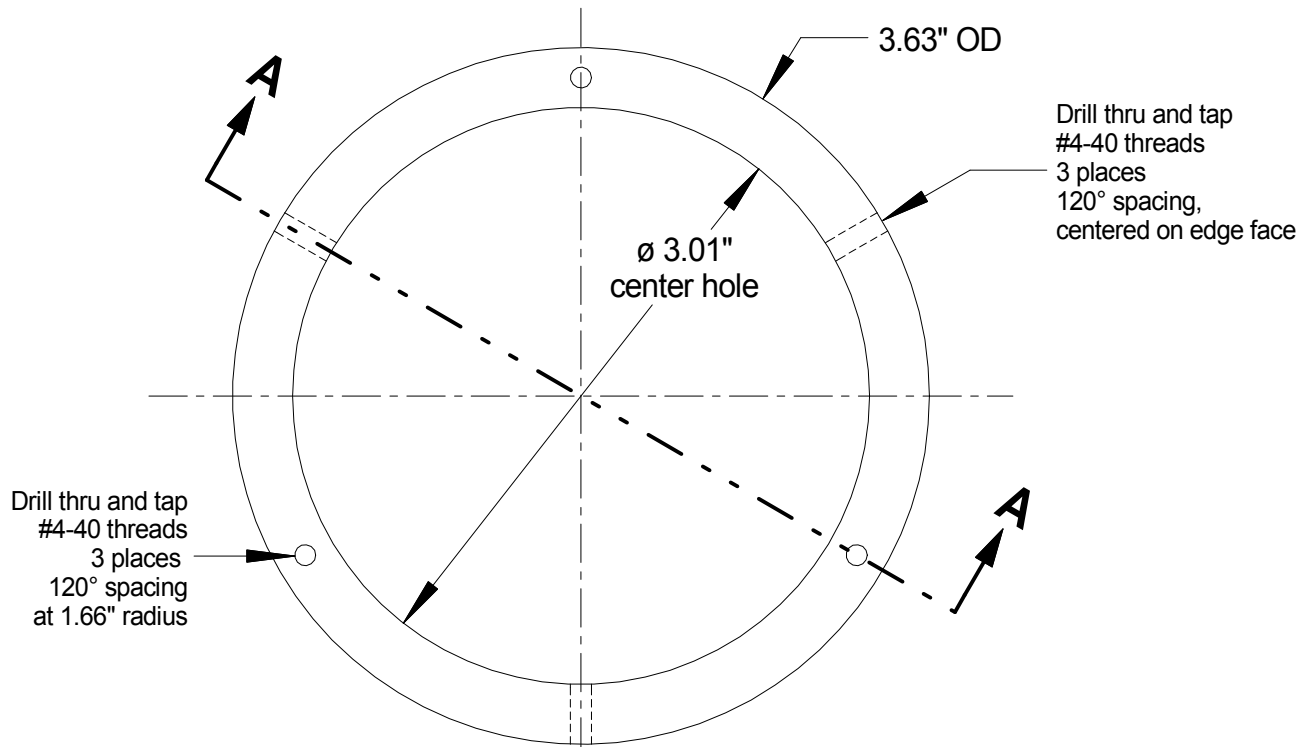


Print scale in Inches



Project: <b>Coldfire</b>	All dimensions are in inches	Date: Jan. 7, 2006	Vern Knowles www.vernk.com
	CAD scale: 1" = 5"		
Drawing: Nosecone	Rev: B		

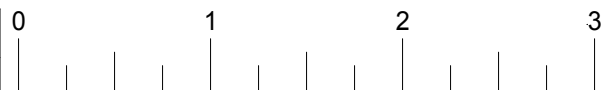
# Top View



## Section A-A

Material: Aluminum

Print scale in Inches



Project:

# Coldfire

All dimensions are in inches

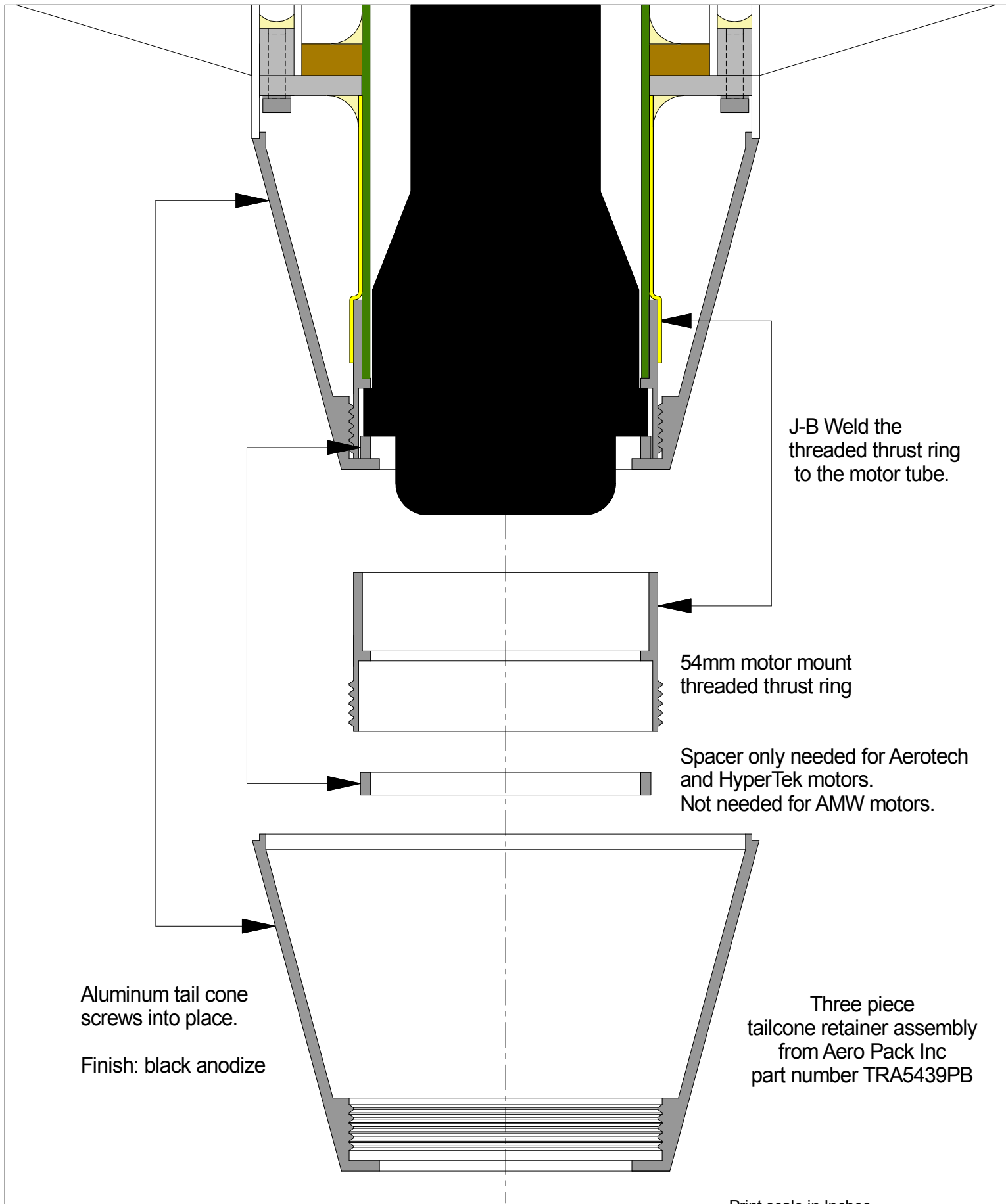
CAD scale: 1" = 1"

Drawing: Nosecone retainer ring

Rev: B

Date: Jan. 7, 2006

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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.

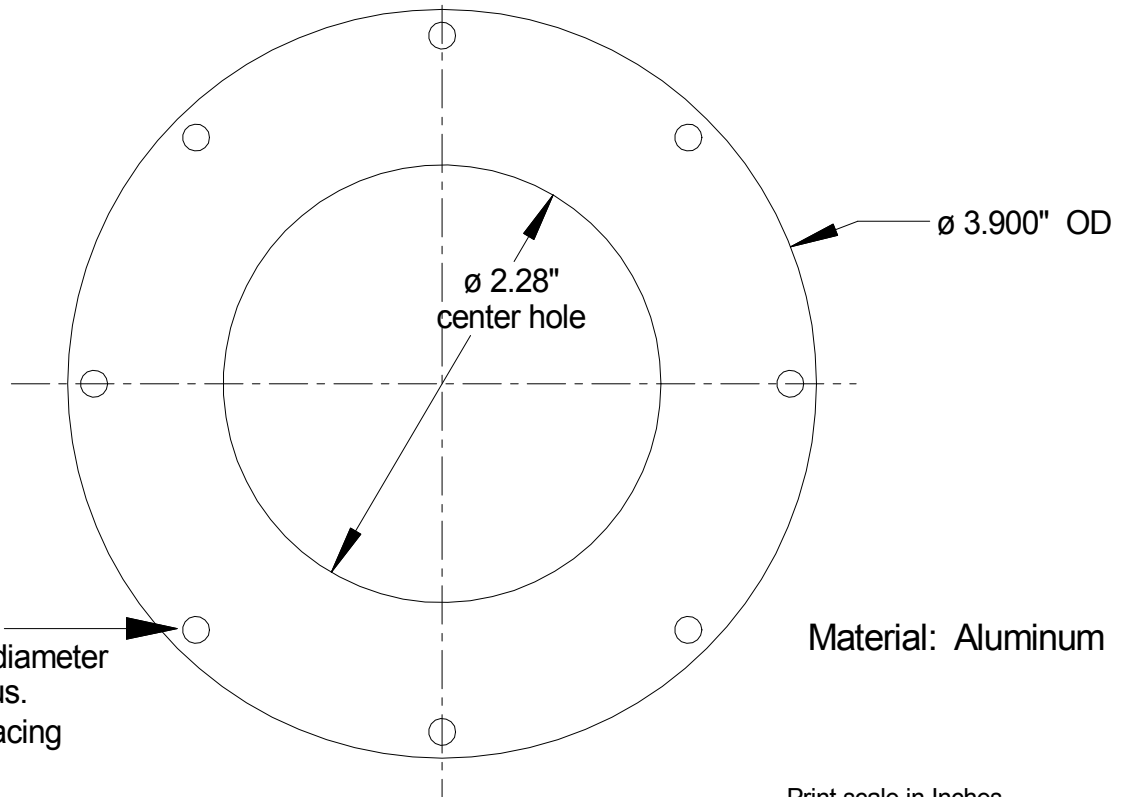
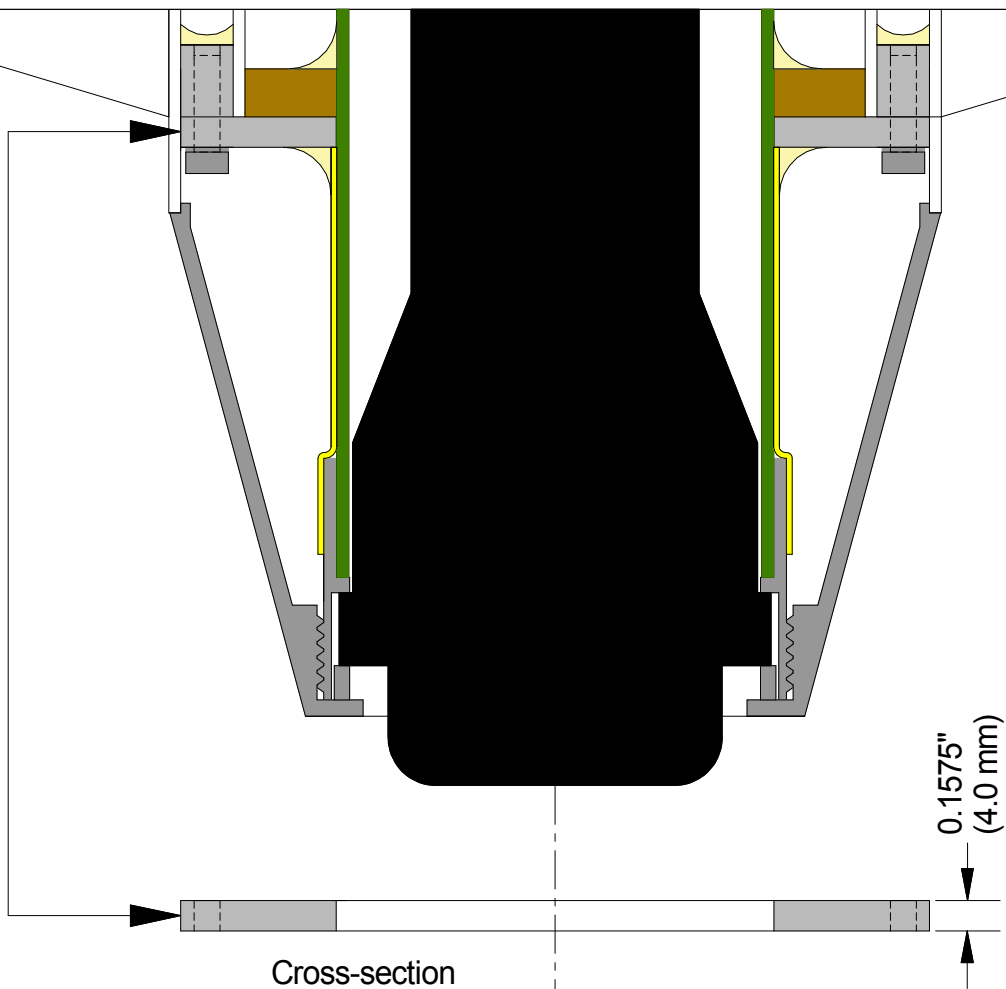
Aluminum tail cone screws into place.  
Finish: black anodize

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

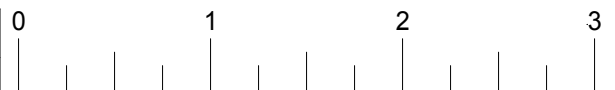
Print scale in Inches



Project:	<b>Coldfire</b>	All dimensions are in inches
		CAD scale: 1" = 1"
Drawing: Tailcone assembly	Rev: B	Date: Jan. 7, 2006



Print scale in Inches



Project: **Coldfire**

All dimensions are in inches

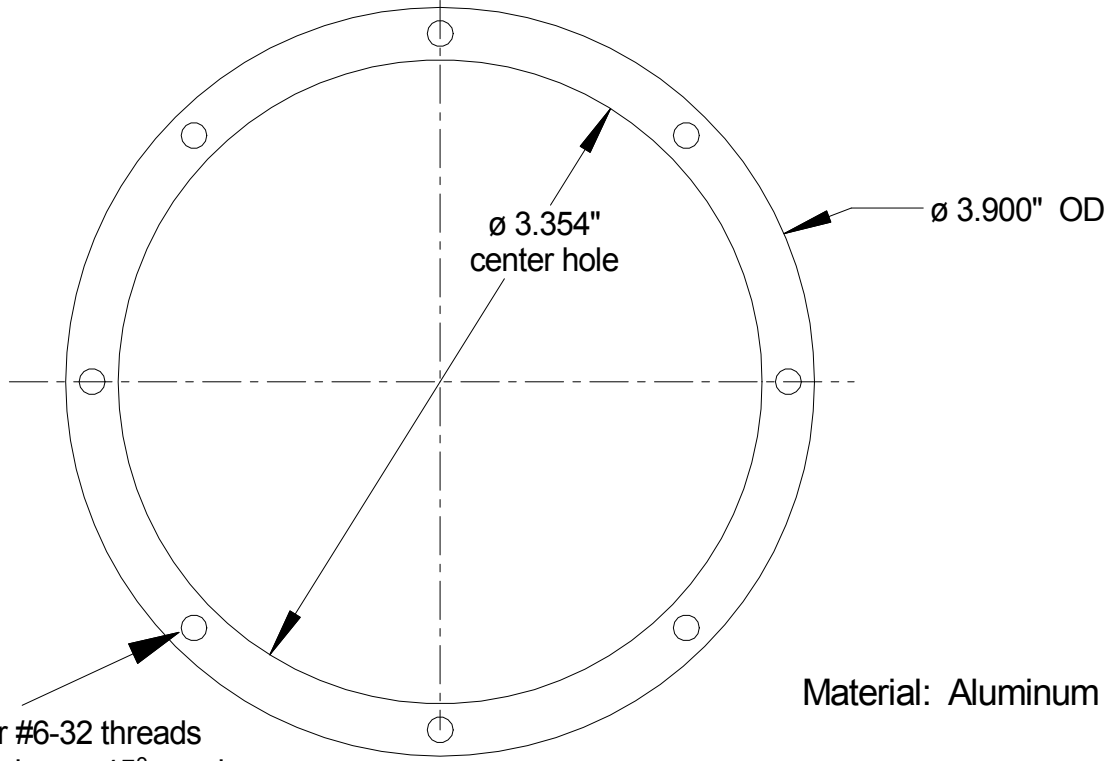
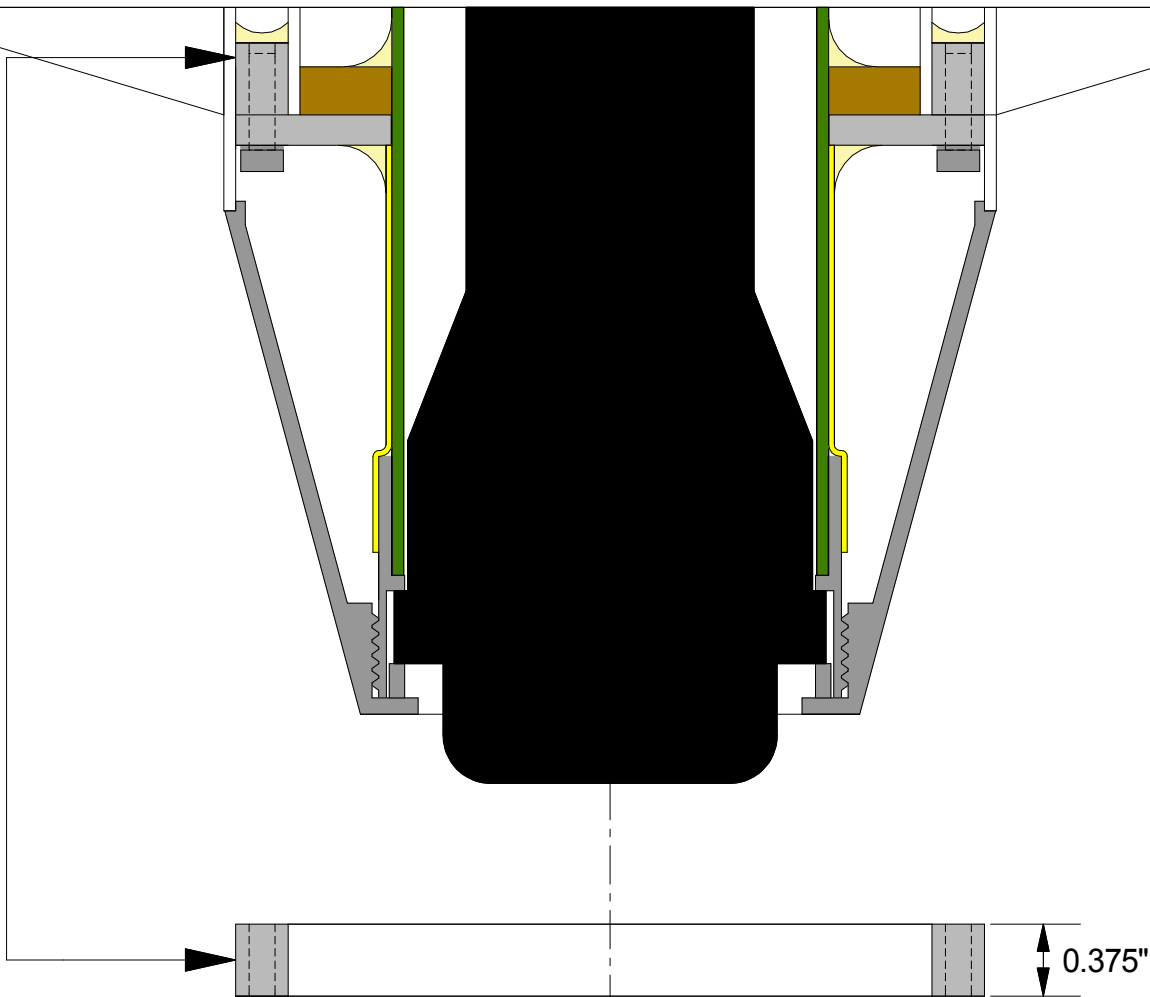
CAD scale: 1" = 1"

Drawing: Mounting plate for 54mm motors

Rev: B

Date: Jan. 7, 2006

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

Material: Aluminum

Print scale in Inches



Project: **Coldfire**

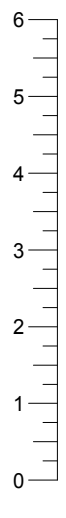
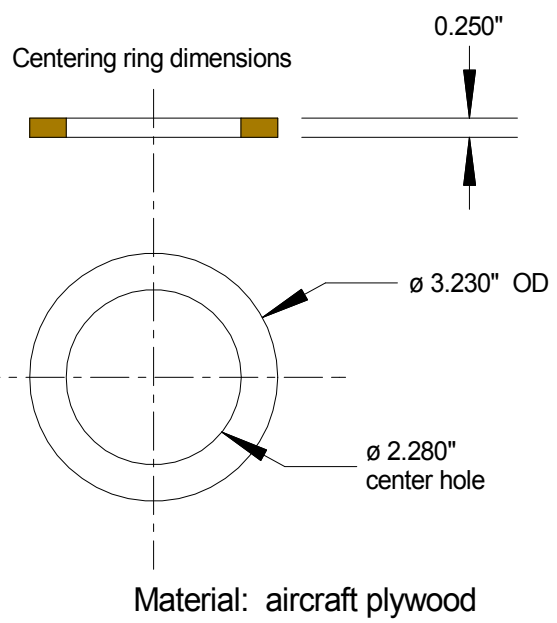
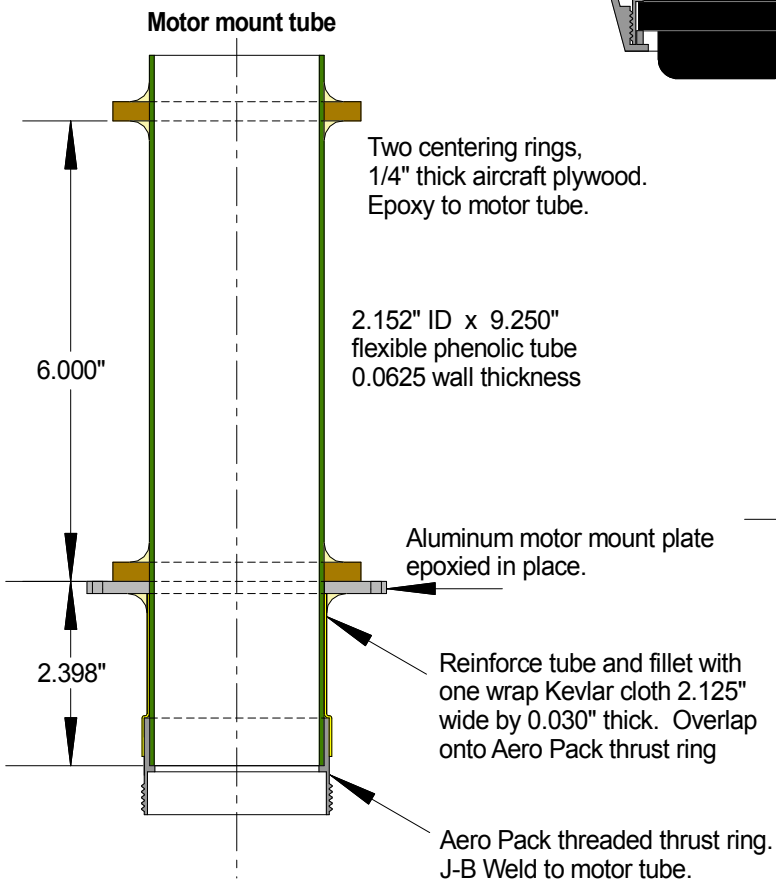
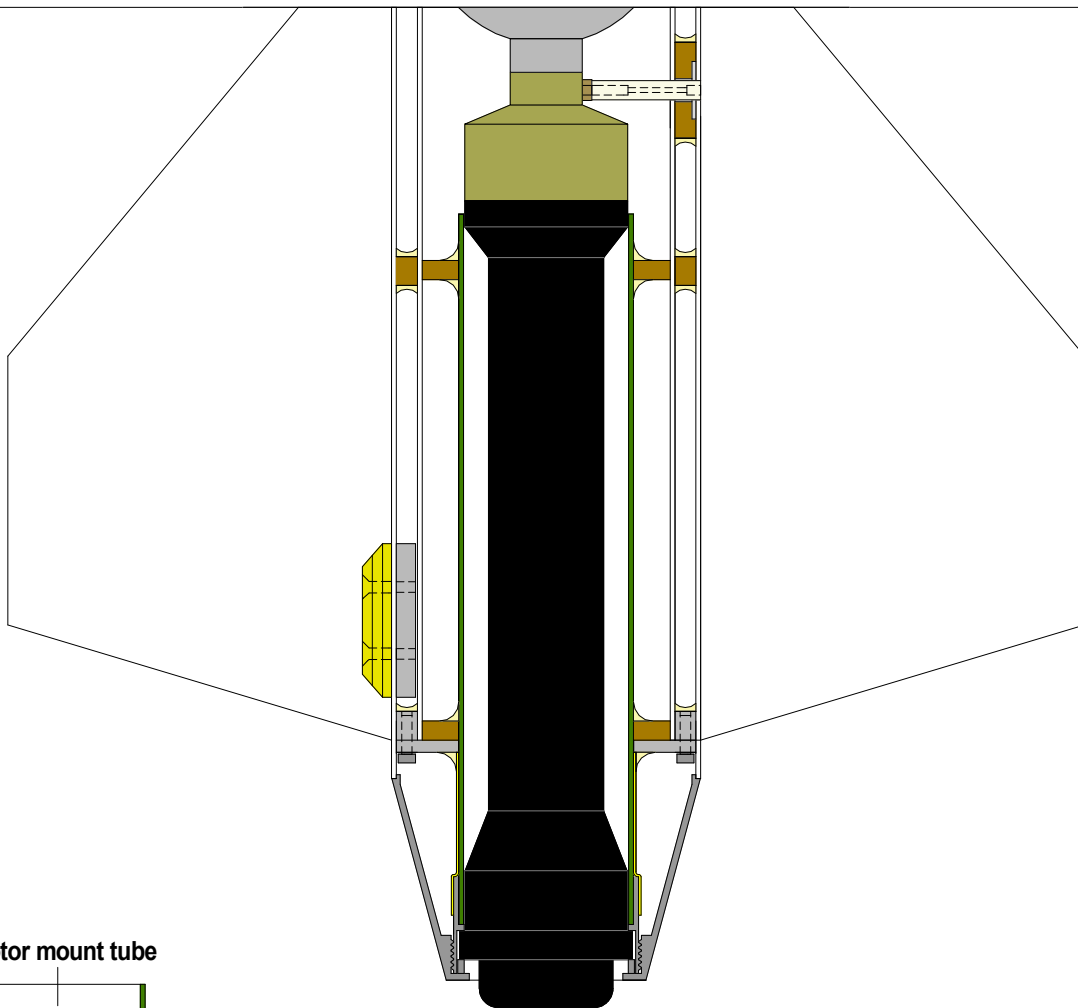
Drawing: Centering Ring CR1

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

Rev: B

Date: Jan. 7, 2006

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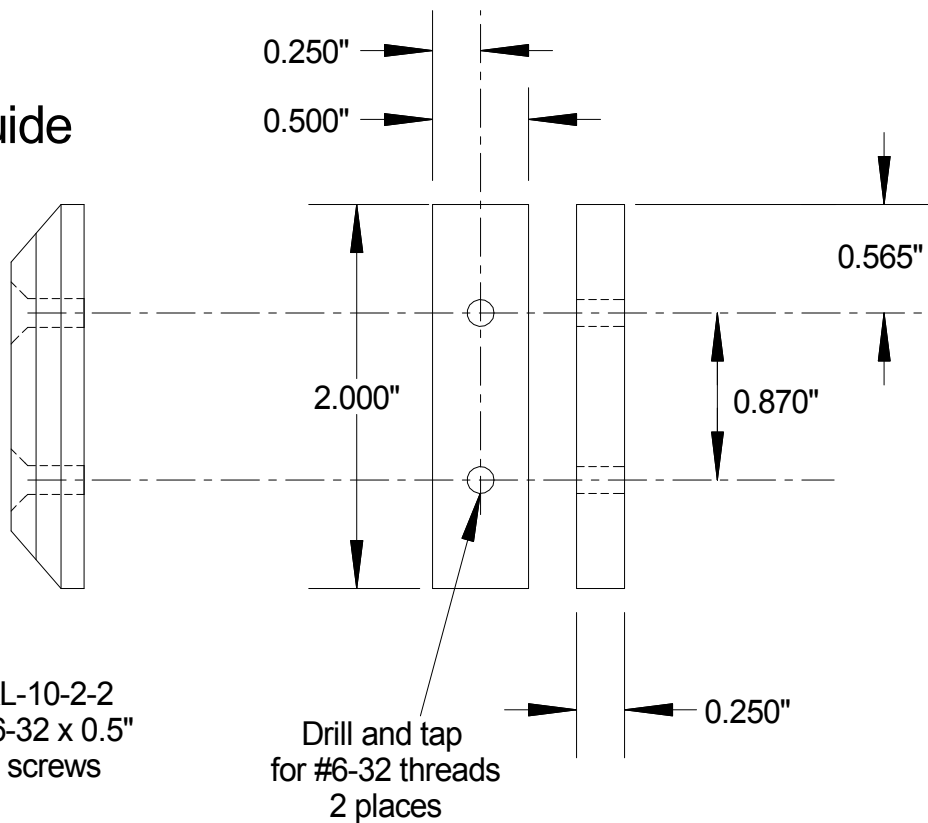
Print scale in Inches



Project: <b>Coldfire</b>	All dimensions are in inches	Date: Jan. 7, 2006 Vern Knowles www.vernk.com	
	CAD scale: 1" = 2.5"		
Drawing: Hybrid motor tube	Rev: B		

## Rail guide backer plate

Rail guide



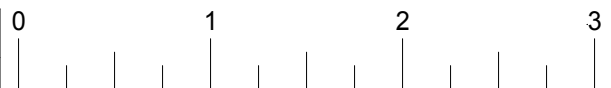
PML rail guide LRL-10-2-2  
Mount using two 6-32 x 0.5"  
flat head machine screws

Drill and tap  
for #6-32 threads  
2 places

Rail Guide material: Urethane

Backer Plate Material: Aluminum

Print scale in Inches



Project:

**Coldfire**

All dimensions are in inches

CAD scale: 1" = 1"

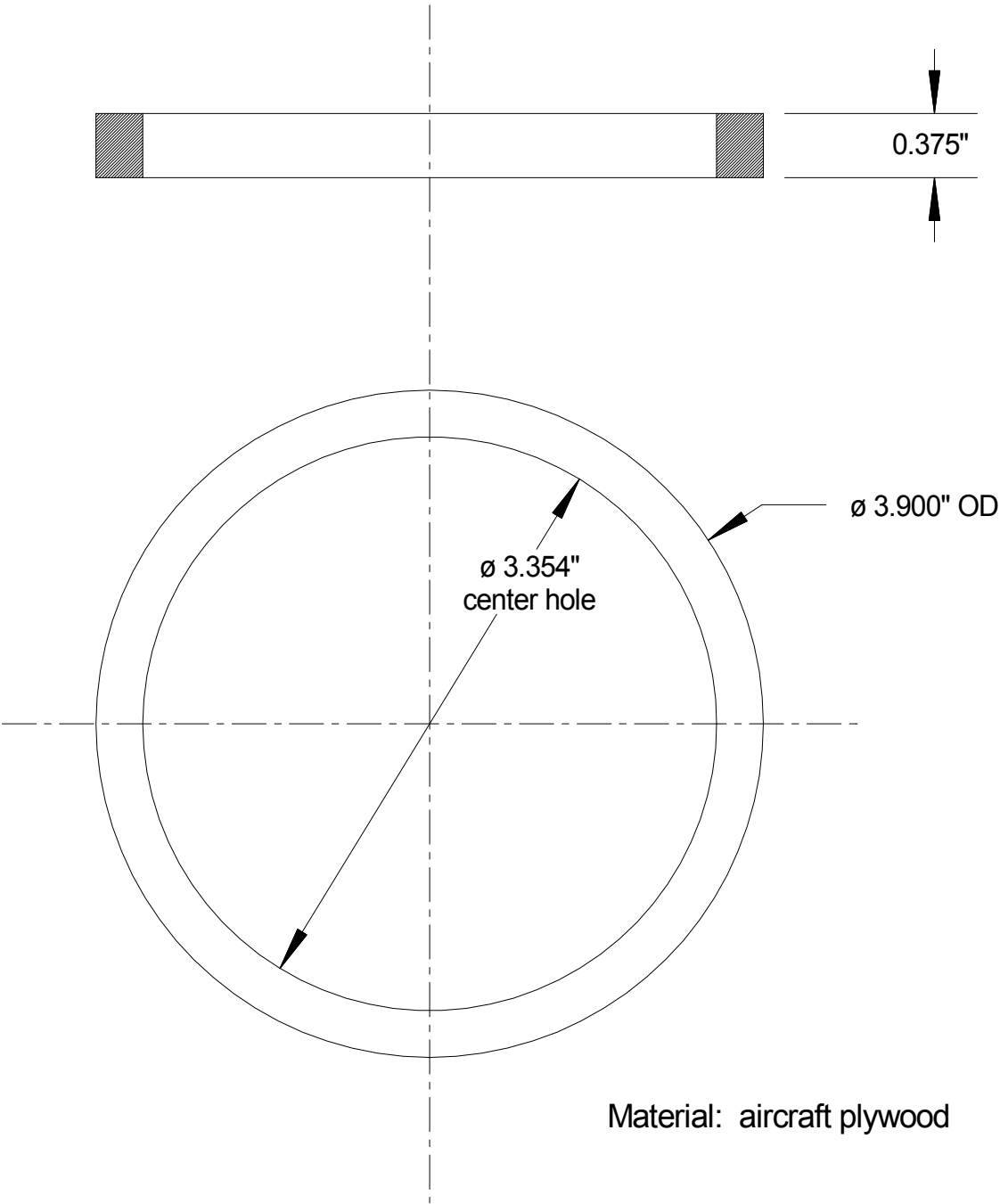
Drawing: Rail guide and mounting plate

Rev: B

Date: Jan. 7, 2006

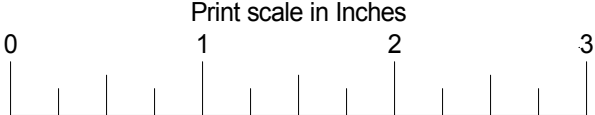
Vern Knowles www.vernk.com

# Centering Rings CR2, CR3, CR4



Project: **Coldfire**

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



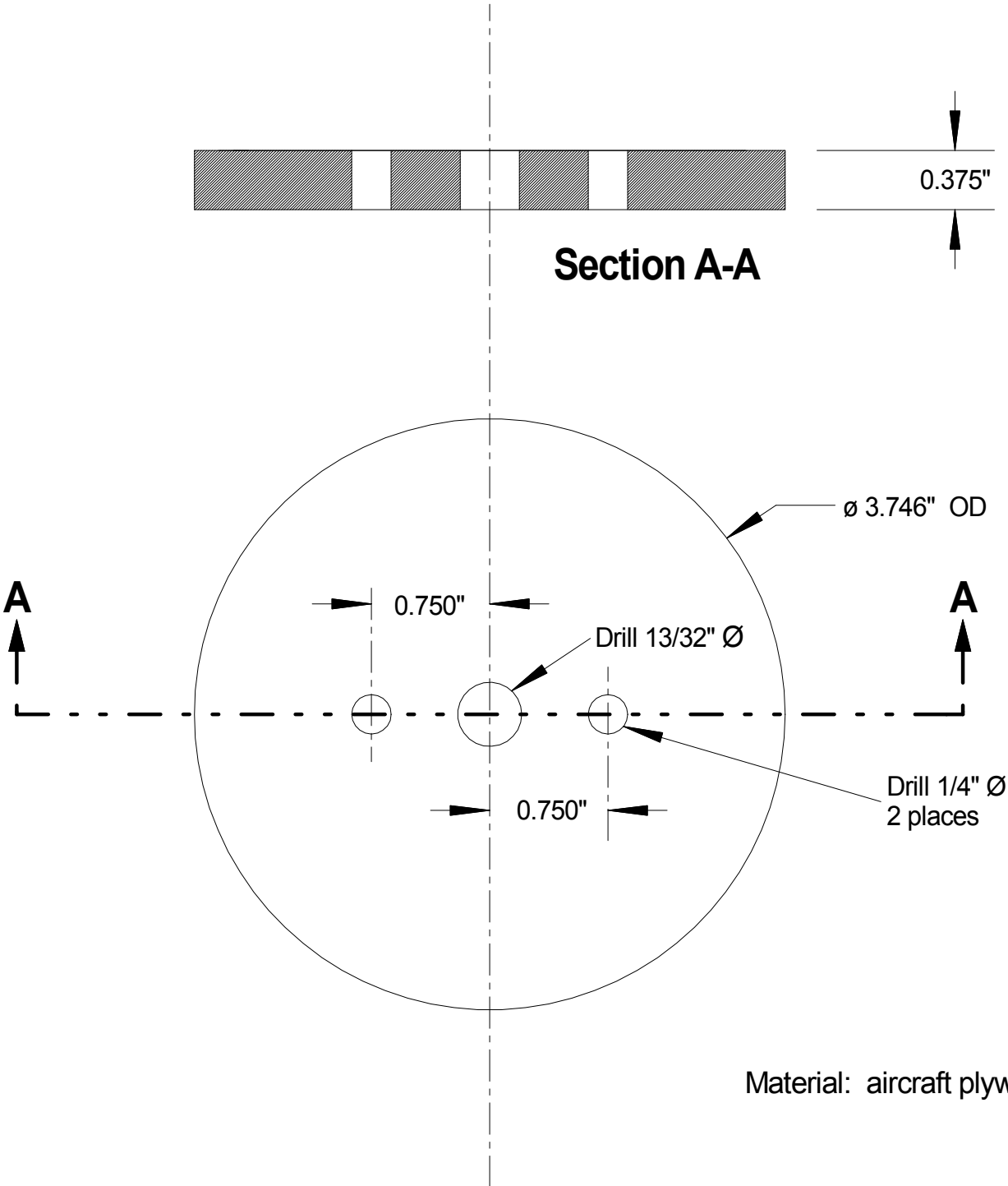
Drawing: Centering Rings CR2, CR3 and CR4

Rev: B

Date: Jan. 7, 2006

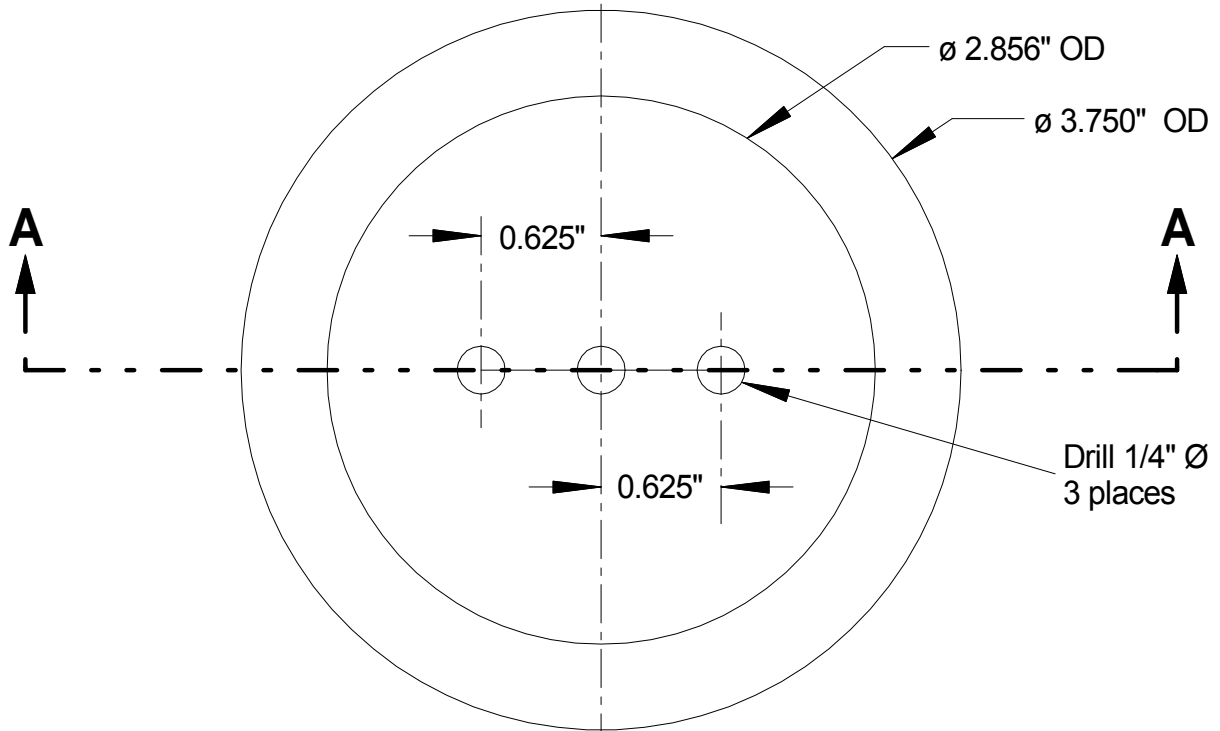
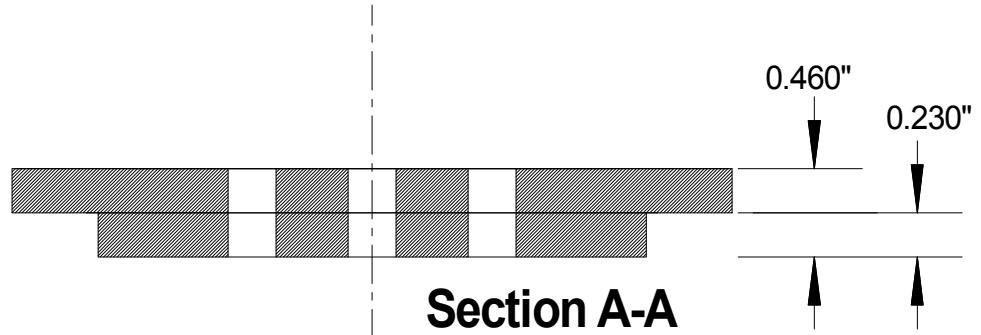
Vern Knowles www.vernk.com

# Bulkhead B1



Material: aircraft plywood

# Bulkhead B2



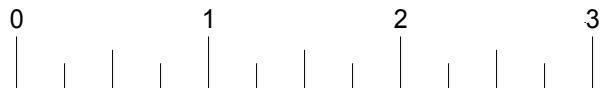
Material: aircraft plywood

Project: **Coldfire**

All dimensions are in inches

CAD scale: 1" = 1"

Print scale in Inches



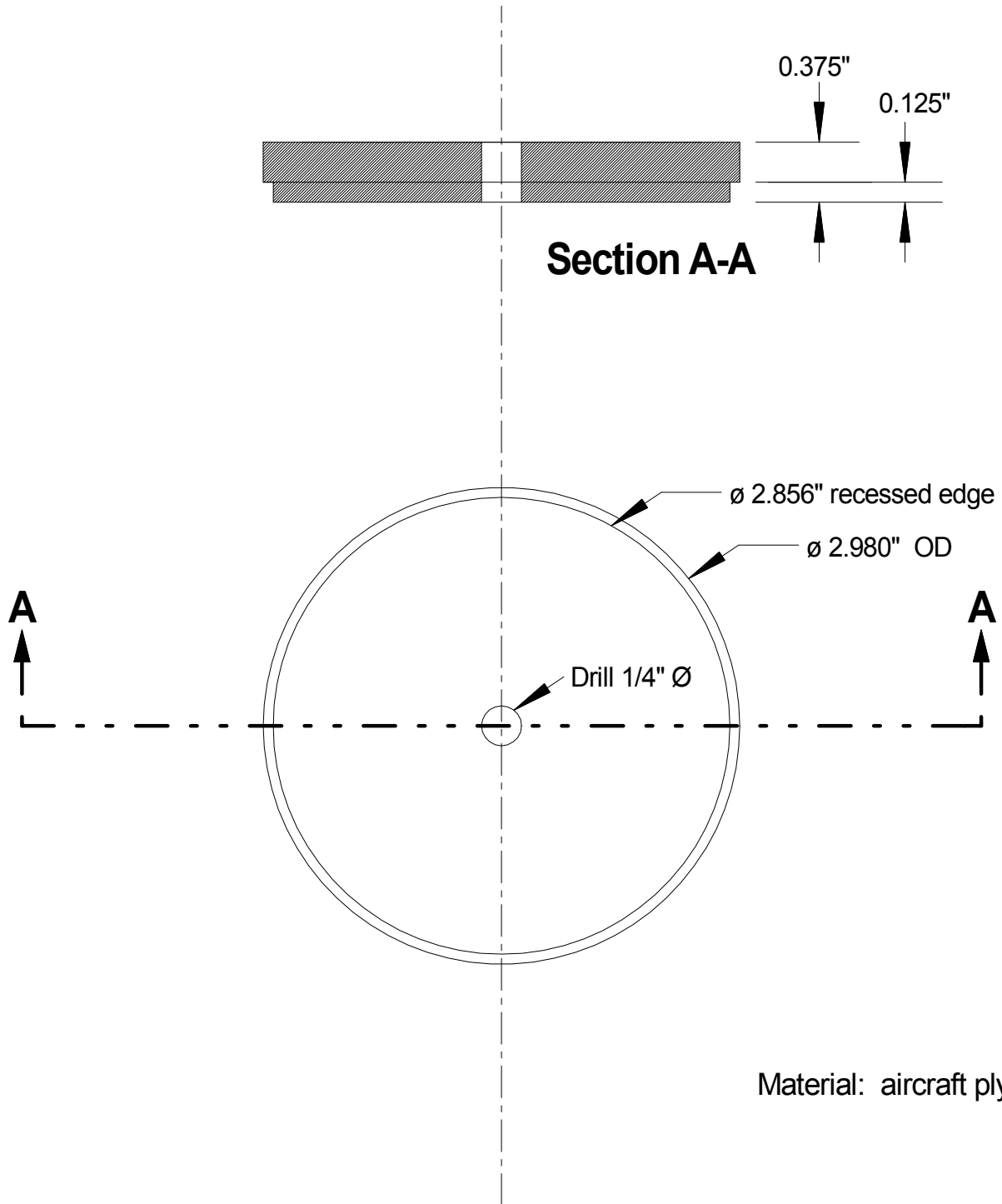
Drawing: Bulkhead B2

Rev: B

Date: Jan. 7, 2006

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# Bulkhead B3



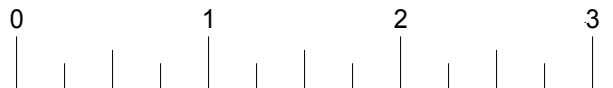
Material: aircraft plywood

Project: **Coldfire**

All dimensions are in inches

CAD scale: 1" = 1"

Print scale in Inches



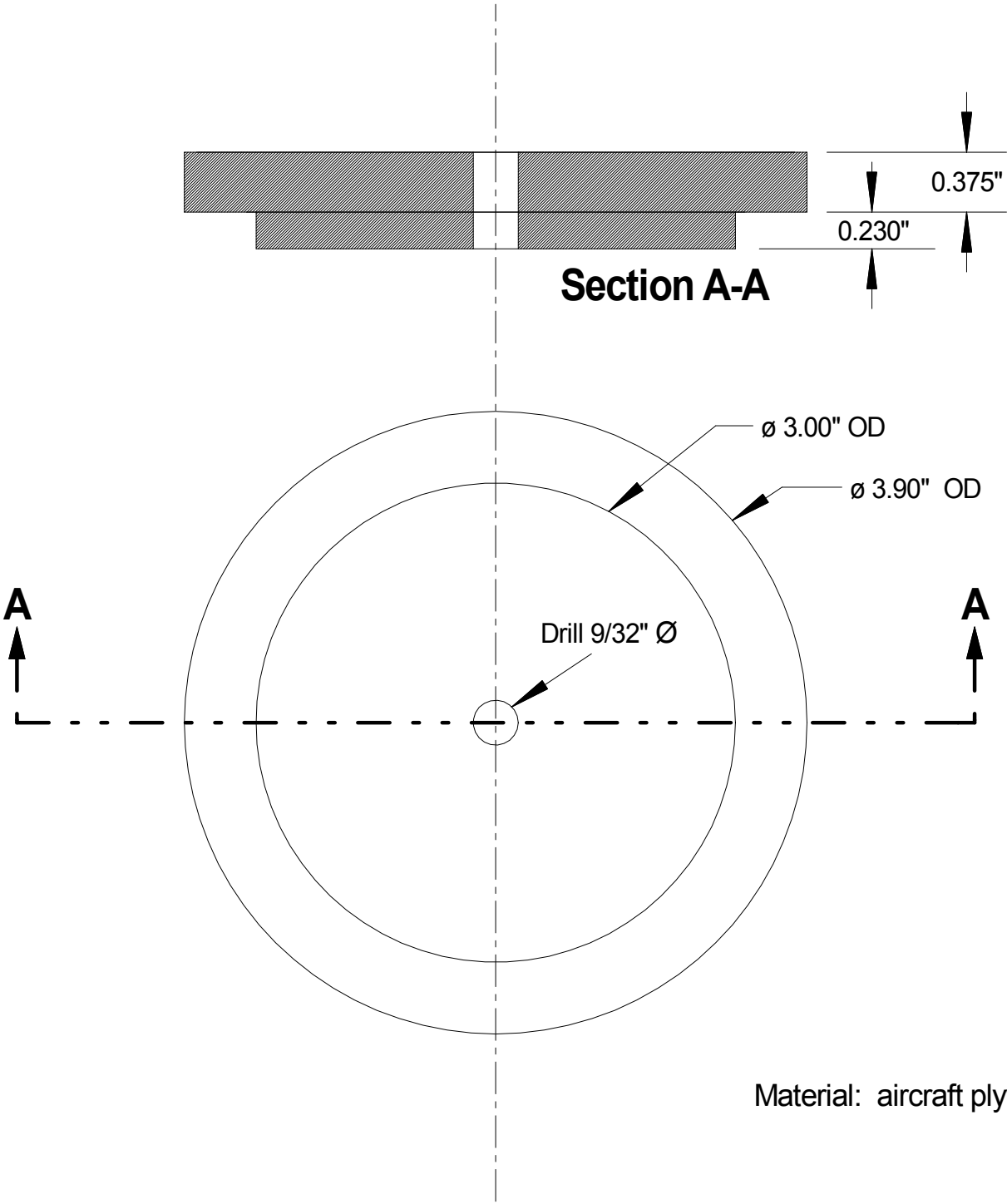
Drawing: Bulkhead B3

Rev: B

Date: Jan. 7, 2006

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# Bulkhead B4



Material: aircraft plywood