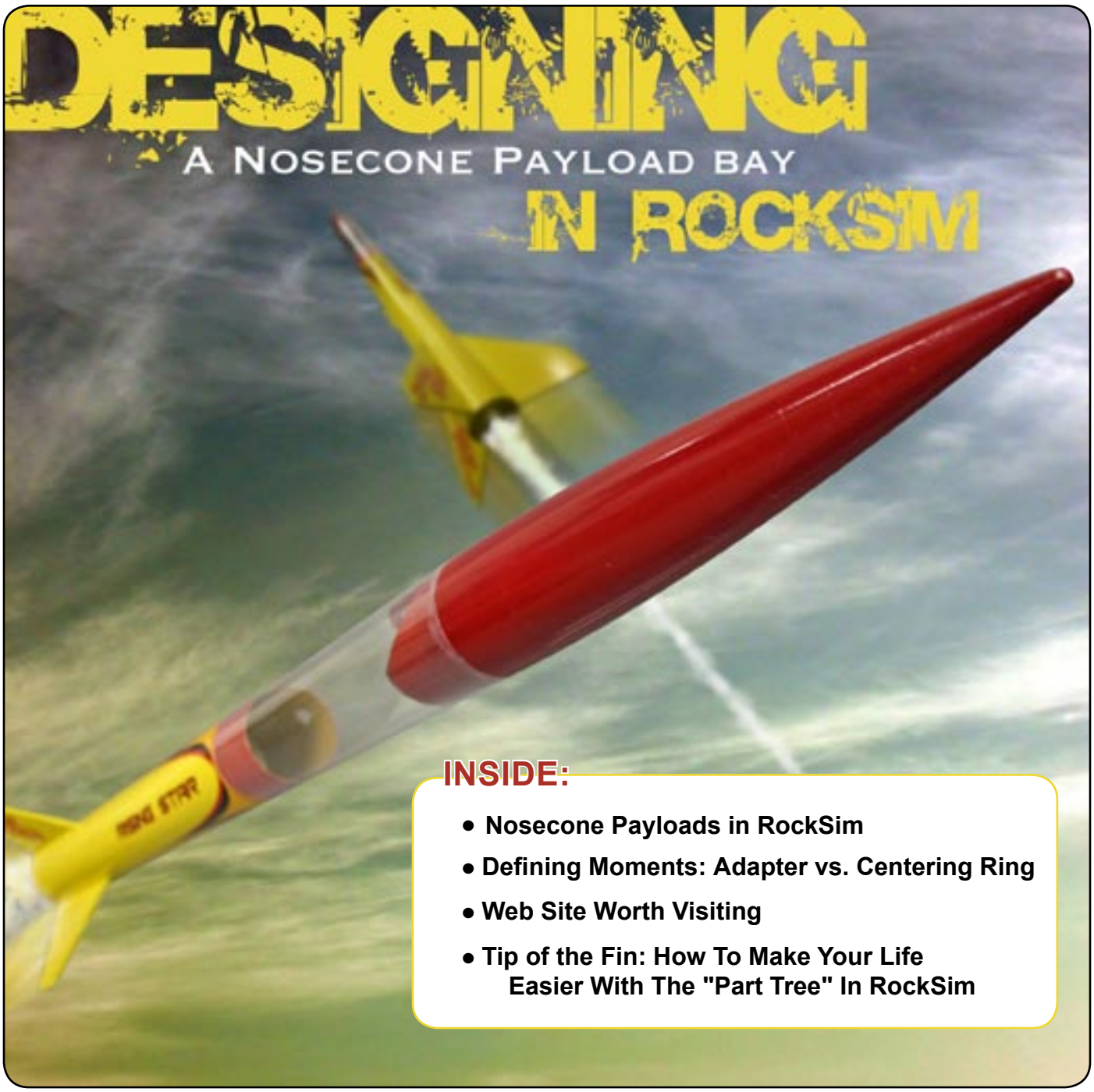
ISSUE 182 - April 24, 2007

APOGEE PEAK OF FLIGHT NEWSLETTER

DESIGNING A NOSECONE PAYLOAD BAY IN ROCKSIM



INSIDE:

- Nosecone Payloads in RockSim
- Defining Moments: Adapter vs. Centering Ring
- Web Site Worth Visiting
- Tip of the Fin: How To Make Your Life Easier With The "Part Tree" In RockSim

Apogee Components

3355 Fillmore Ridge Hts
Colorado Springs, Colorado 80907-9024 USA
www.ApogeeRockets.com e-mail: orders@ApogeeRockets.com
phone: 719-535-9335 fax: 719-534-9050

Designing a Nosecone Payload Bay in RockSim

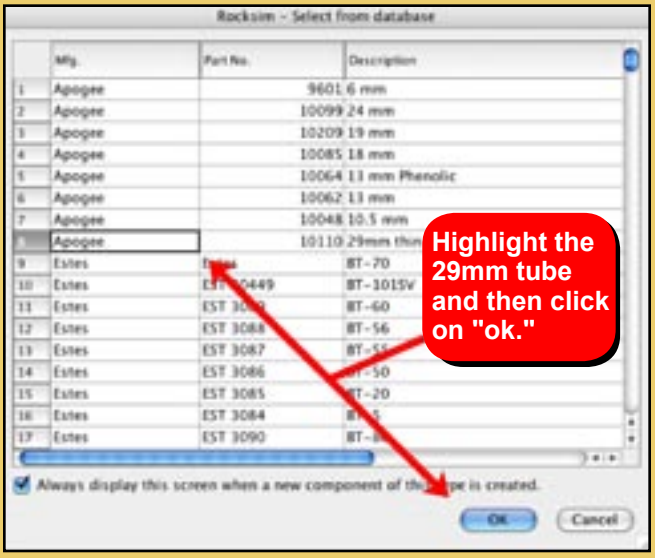
by John Manfredo

How to design a payload bay using Rocksim for a rocket with little space

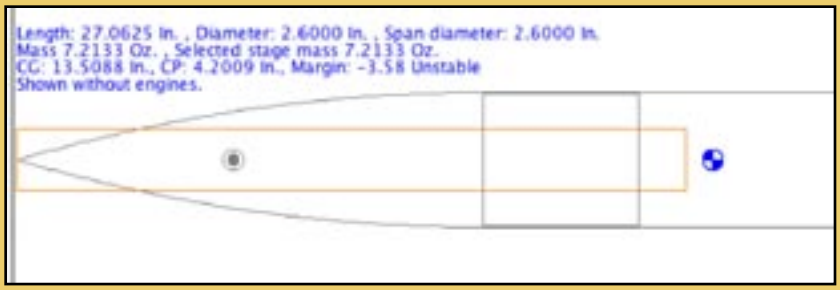
Sometimes when designing a rocket, it is nice to have a payload bay. Unfortunately, due to the design, there may not be room for the standard payload bay in the model. The payload bay is usually located beneath the nose cone and above the main body tube. An example of this is the Dynastar Rising Star rocket (http://www.apogeerockets.com/rising_star.asp). But when the rocket is short enough that there is no room for this, or the main payload tube will be full, then you can make another payload tube in the nose cone.

I won't be covering how to physically make this kind of setup, but will be concentrating on how to design it in RockSim. To start off, select the body tube and nosecone that you would like to use. For my choice I am using the BT-80 body tube and nose cone as seen in Picture 1.

Picture 1



Picture 2



Picture 3

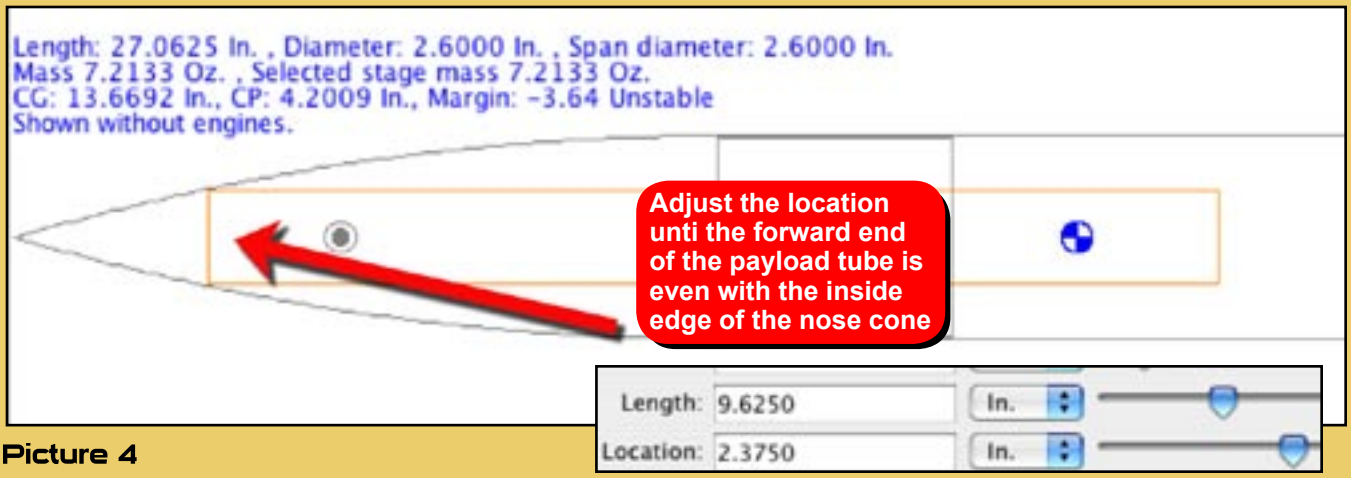
The next step is to highlight the nose cone on the components screen and then click on "inside tube" to add one of these to the design. As you can see in Picture 2, I decided to select an Apogee 29mm tube to use for the payload tube. I highlight the part and then click on the OK button. Picture 3 shows where the RockSim default location puts the tube. There are a few alterations that need to be made.

continued on page 3

About this Newsletter
You can subscribe to receive this e-zine FREE at the Apogee Components web site (www.ApogeeRockets.com), or by sending an e-mail to: ezine@apogeerockets.com with "SUBSCRIBE" as the subject line of the message.

Newsletter Staff
Editor / Writer: John Manfredo
Layout / Cover Artist: Dave Curtis
Proofreader: Michelle Mason

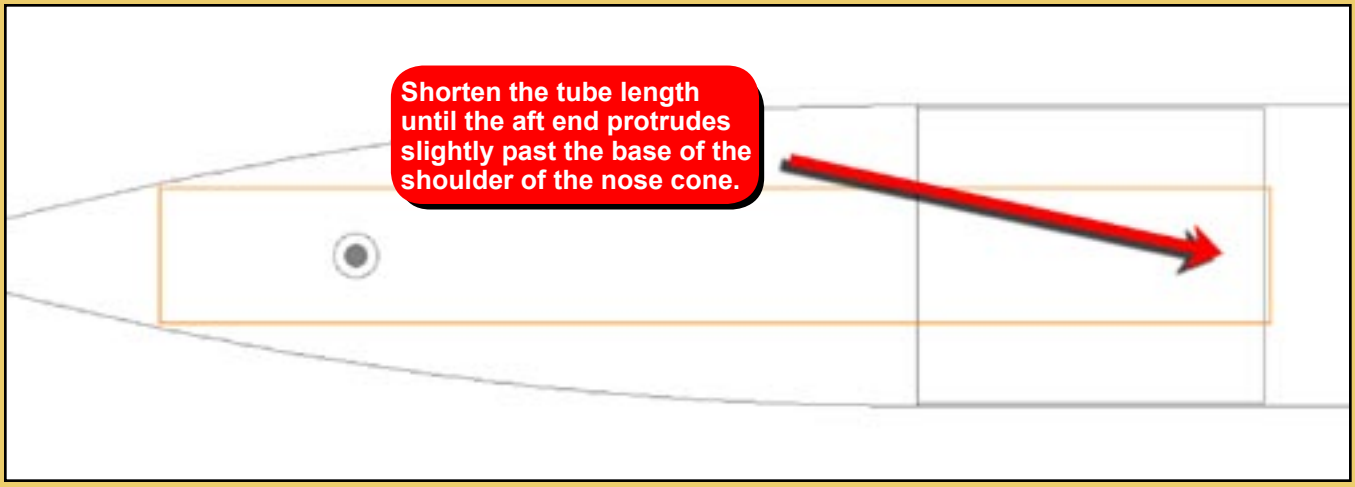
continued from page 2



Picture 4

Referring to Picture 3 again, you will see that the payload tube needs to be shifted aft a few inches, in addition to the length of the tube needing to be adjusted. To do this, select the tube and click on the part. The first adjustment we will make is that of the location of the forward end of the tube. Picture 4 shows where the proper location needs to be for this. Each side of the forward end should be touching the inside edge of the nosecone. The easiest way to accomplish these adjustments is to use the slider bar, seen here as well. When actually building the model this will position the payload tube on the centerline of the rocket.

The next step to take is to shorten the tube, because at this point, it is too long for the actual design. As shown in Picture 5, the object is to shorten it until the aft end of the tube is not quite even with the base of the nosecone. In the actual mode you will want a way to grab onto the tube for easy removal. As said previously, the best way to do this in RockSim is to use the slider bar. You may have noticed that at this point the Center-of-gravity is behind the Center-of-Pressure, making for a very unstable design. I don't show the entire rocket, but if I did you would see that my design has no fins right now. This accounts for the Center-of-Pressure being so far forward.



Picture 5

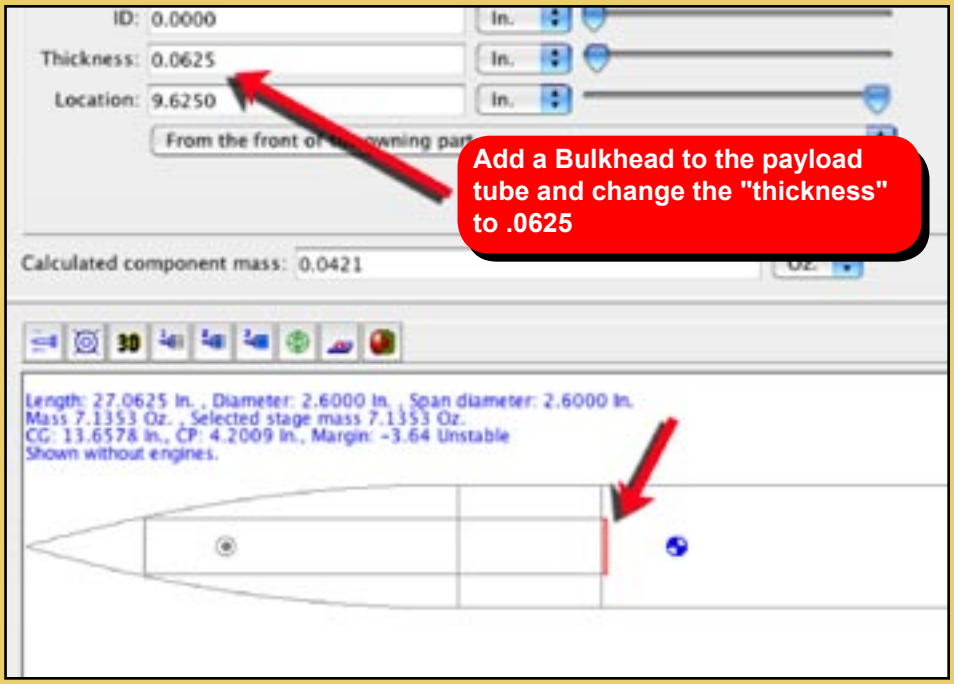
continued on page 4

continued from page 3

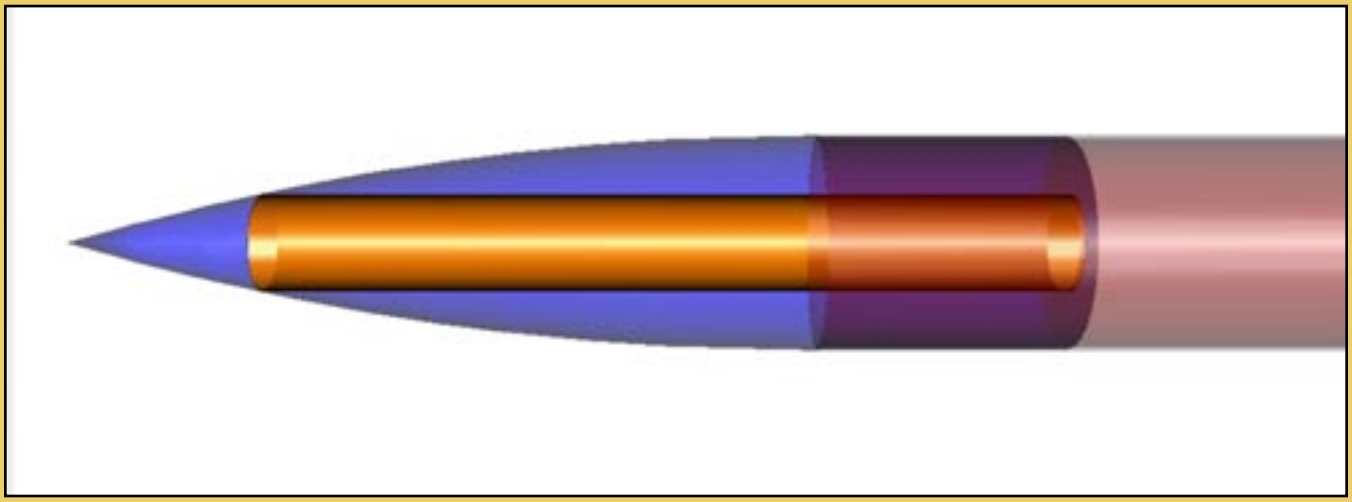
Picture 6 illustrates the next part of the design process as I add on a bulkhead to the payload tube. In the real rocket this will seal the bay from any hot gasses that may make their way up to the nosecone. To do this I simply highlighted the payload tube and clicked on "bulkhead" to add the component. The default bulkhead database screen will pop up, but I just cancel out of this.

Certain dimensions will already appear at this point for the bulkhead. One thing that will need to be altered is the thickness of the part. I am using 1/16" cardstock for the bulkhead, but enter whatever thickness of material you are using at the time. I convert 1/16" to .0625" for Rocksim and then move on to the location of the part. I chose to make it flush with the end of the payload tube. Picture 6 also shows this.

That is all there is to it! The payload tube is all set in Rocksim for my simulations. I changed the view to 3D for you to see what it would look like. Picture 7 gives you a side view of this design using different colors to accentuate the different pieces. Finally, on the next page I rotated the design in 3D in order to provide a different perspective on the model. As you can see, this provides a very useful place to put a device such as a locating transmitter or simple altimeter.

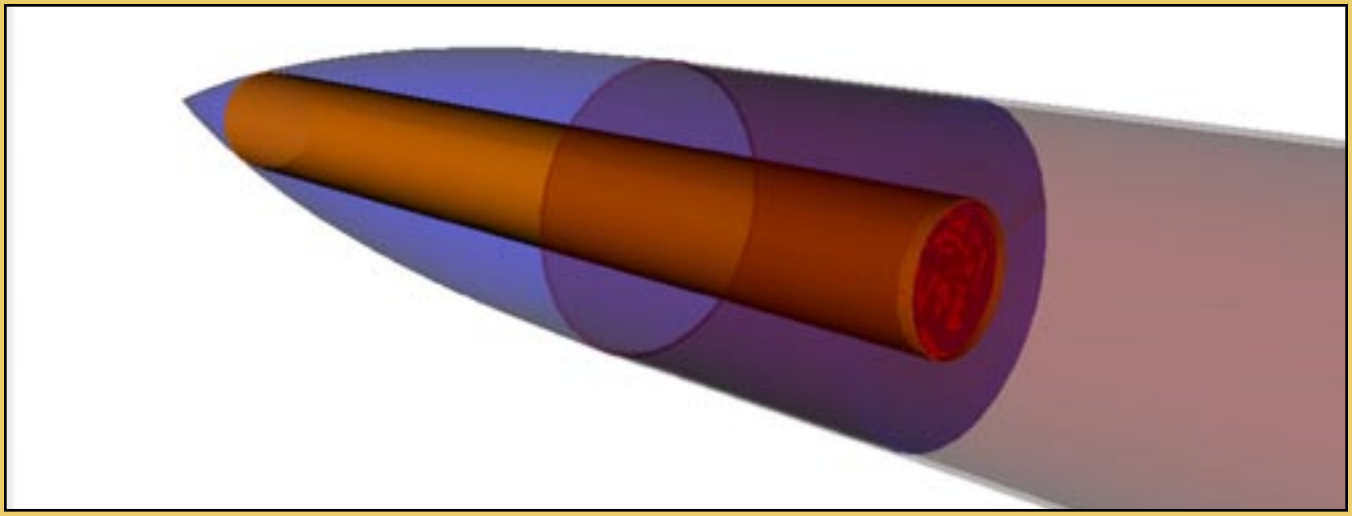


Picture 6



Picture 7

continued from page 4



Picture 8

About the Author

John Manfredo is a passsionate rocketeer, and formally the education coordinator for Apogee Components. He is Level 1 High-Power Certified and has been building and flying rockets since the early 1970's. He enjoys passing his love of rocketry down to his kids.

Question & Answer

Question: "The instructions for the F37W reload kit list an 'RMS-Plus delay element' described as a 'short solid part'. Either something has changed since they printed the instructions or this part is missing. I'd venture to guess that they combined the delay and ejection charge. I do not have the delay. The red ejection charge is open on one end with grains exposed. I have another ejection charge from a different kit and both ends are encased in red plastic."

Answer: It is very common for different parts to slip inside of others from all the movement during transport. I remember when I first started using reloads, I thought I was missing the propellant grain until I found it inside of the liner tube. What I think happened is that the delay grain is stuck in the end of the red ejection charge holder. In other delay grain holders there are 2 ends encasing the charge as with the 29/40-120 reloads. One end of the cap goes on the nozzle and the other goes on the ejection charge well. The reload that you have is different in that aspect that the red cap is for the nozzle and the ejection charge is held in by the paper disk. This is the common way to hold an ejection charge in high power motors. If you take the delay grain out of the red cap I'd venture a guess that you will find the ejection charge covered by a smaller paper disk.

Reloads are available for immediate shipping at: http://www.apogeerockets.com/Aerotech_Reload_Motors.asp.

SUNWARD
AEROSPACE GROUP LIMITED
Available Worldwide through Quality Hobby Shops and Online Retailers
New designs NOW available at you local retailer:
Interplanetary Shuttle
Small rocket with lots of laser cut balsa. Easy to build with distinctive design. 0.976" dia 11" long
Box Racer
Foam board fins for a different build. Includes pre-printed side panels. Plastic nose cone. 19" long 0.976 dia.
Space Speedster
Printed body with foam board fins. Fireprinted fins. Laser cut foam mounting rings.
Flechette
3 fins 6 piece laser cut balsa. Flights to 1000' / 300m. Parachute recovery.
Flechette: The word flechette is French for "dart." In military use it is a projectile having the form of a small metal dart, a sharp-pointed tip and a tail with several vanes to stabilize it during flight.
Explorer
Laser cut 4 fin with distinctive design. 21" long 0.976" dia. Parachute recovery. Flights to 750' / 250m
Bug Me Not!
Great beginner rocket. Laser cut fins. Streamer recovery. 0.976" dia. 11" long.
Lightning Fury
Simple to build. Laser cut fins. Streamer recovery. 0.796" dia. 21" long
Telescope Kit
Perfect for science projects or science fairs. Working telescope (not a rocket). Custom high quality tubing with black coating on the inside. Precolored - no painting required. Glass lenses.
Check out the rest of our new mounting kits, BT50 nose cone, BT55 tubes - 18" long, 29mm thrust rings
NOW SHIPPING
www.sunward1.com info@sunward1.com
Direct 416-953-1847 fax 416-245-7985

UK Rocketry Supplier

Nose Cones, Body Tubes, Alkats kits, Pro X Motors, Centering rings, Chute Calculators
Fins, Parachutes, Rocket Kits, Balsa, Estes Motors, RockSim, X-Form Chutes, and much more!

- Safety Before Profit
- Trust Us and Try Us
- Rocketry FUN

Apo11o All Things Rocketry Here in the UK
http:www.apo11o.co.uk
Run by UKRA RSO's

Apogee Components, Inc. is pleased to announce the second in a yearly grant program geared toward model rocketry education organizations!

Apogee Grant Program

The rules are simple:

1. Entrants must submit an essay to Apogee. There is no length requirement for the essay.
2. Any club, organization, or school program, is eligible for entry. This would include rocketry clubs or prefectures, 4H, scouts, etc.
3. The content and purpose of the essay is as follows:
   - If we gave you $300.00, How would you use it to impact the rocketry community?
   - How many people do you think it will reach?
   - How many people will be involved in the organizing and running of the event?
   - How big of an effect will it have on the rocketry community?
4. One of the biggest things to keep in mind when composing your essay is **"How is what I am planning unique?"**

There will be only one winner of the grant, which is $300.00 toward any order with Apogee Components.

The deadline for entry is November 30, 2007.

Make sure it is post-marked by November 30th!

The grant winner will be anounced on January 1, 2008.

What a great way to start off the new year!

Or send to:

3355 Fillmore Ridge Heights
Colorado Springs CO 80907
or: orders@apogeerockets.com

http://www.apogeerockets.com/rocket_grant_money.asp

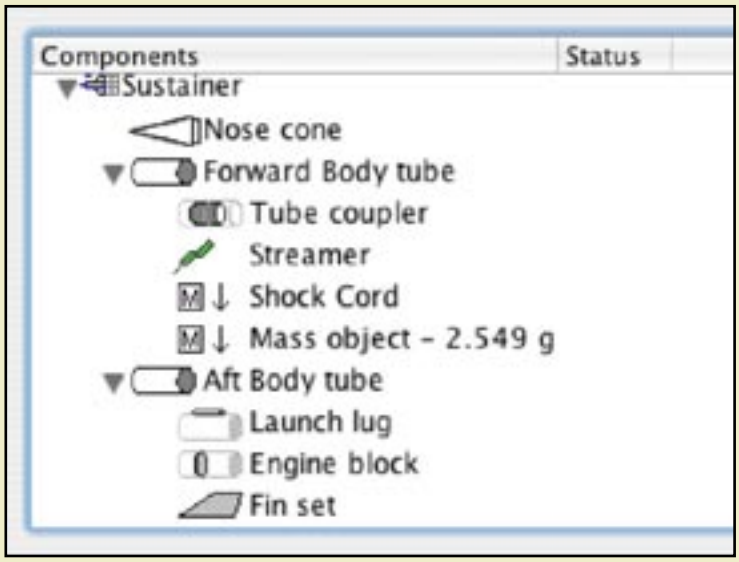
TIP OF THE FIN

The tip for this issue is about how to make your life a lot easier with the "parts tree" in RockSim.

So much of the time we see design files where there are many different tubes in the design. This would include anything from body tubes to motor mount tubes to payload tubes and so on. By the time you have that many tubes in the design it becomes very difficult to tell each one apart, and you wind up wasting much of your valuable time tryng to find the one part that you need to do some work on!

The best tip I can give is to NAME your parts separately so that it is very easy to tell them apart. As seen in the picture on the right, it becomes immediately apparent which tube is which. This tip also applies to centering rings, mass objects and other parts. The more detail you go into makes it so much easier to trouble shoot problems that arise, and just simply make things easier so that you can spend a lot more time building and flying the models that you design!

If you have a tip to share, please send it to us at orders@apogeerockets.com



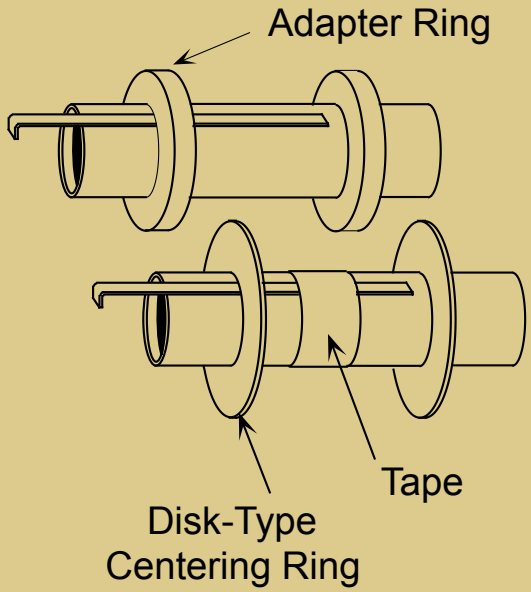
DEFINING MOMENTS

What is an **Adapter Ring** versus a **Centering Ring**? The short, thick-walled cylinders used to center one tube inside another are called adapter rings. Centering rings are similar to adapter rings, except they are flat.

If the difference between the two tube diameters is greater than 12.7mm (1/2”), it is probably easier to make a flat disk centering ring than an adapter ring. A centering ring will also weigh less than an adapter ring, which will make your model lighter.

A kit that uses an adapter ring is the Apogee Diamondback (at: http://www.apogeerockets.com/Diamondback.asp.) One of the many kits that use the disk-type centering ring is the Dynastar Rip-Roar, which can be seen at: http://www.apogeerockets.com/Rip-Roar.asp.

Try one of these beautifully-crafted kits today and be prepared to "wow" your friends at the field!



Adapter Ring/Centering Ring Graphic from Model Rocket Design and Construction www.apogeerockets.com

Web Site Worth Visiting

Our website for this issue comes to us via reader Ray Sunderlin. The site is called Encyclopedia Astronautica and can be surfed at http://www.astronautix.com/index.html. If you are a space history "buff", then this site is for you! This is one of those websites that you could get lost in for days. If you have an interest in scale models, you will find a lot of information here as well.

Some of the many areas to peruse include rockets, people, chronology, and spacecraft. I know you must be wondering about the rockets and spacecraft sections being redundant, but the difference is that rockets here are considered missiles and spacecraft are rockets like the Saturn V. Interesting facts are available under all these listings.

There are even Space poems! Michael Collins' wife wrote this one prior to his launch to the Moon on Apollo 11:

I could have sought by wit or wile
Your bright dream to dim. And yet
If I’d swayed you with a smile
My reward would be regret.

So, for once, you shall not hear
Of the tears, unbidden, welling;
Or the nighttime stabs of fear.
These, this time, are not for telling.

Take my silence, though intended;
Fill it with the joy you feel.
Take my courage, now pretended--
You, my love, will make it real.

There is so much to see, as I said before, that you could get lost for days on this site. Now, go enjoy being lost!

We Moved!

We finally did it! After occupying it for 4 years, our old production and manufacturing building just got too tight. Boxes were stacked too high, and it was starting to interfere with processing your rocketry orders. A few months ago, we found a bigger building and started the process of getting it ready for its new task: "The World Headquarters of Apogee Components."

We now have 6,000 square feet of space, with plenty of room to expand our product selection.

Far Right: The construction of the additional offices to make room for future employees to handle your orders faster.

Right: The great big warehouse that we use to hold all of the products we sell.

Far Right: Michelle and Robbie trying to make sense of the warehouse shelving.

Right: Carla, creating a wonderful mural to set the scene in the new office. Blue skies and calm wind - that's what we live for when launching rockets.

Right: The outside of the new building. We have the whole thing to ourselves.

APOGEE COMPONENTS
3355 Fillmore Ridge Heights
Colorado Springs, CO 80907