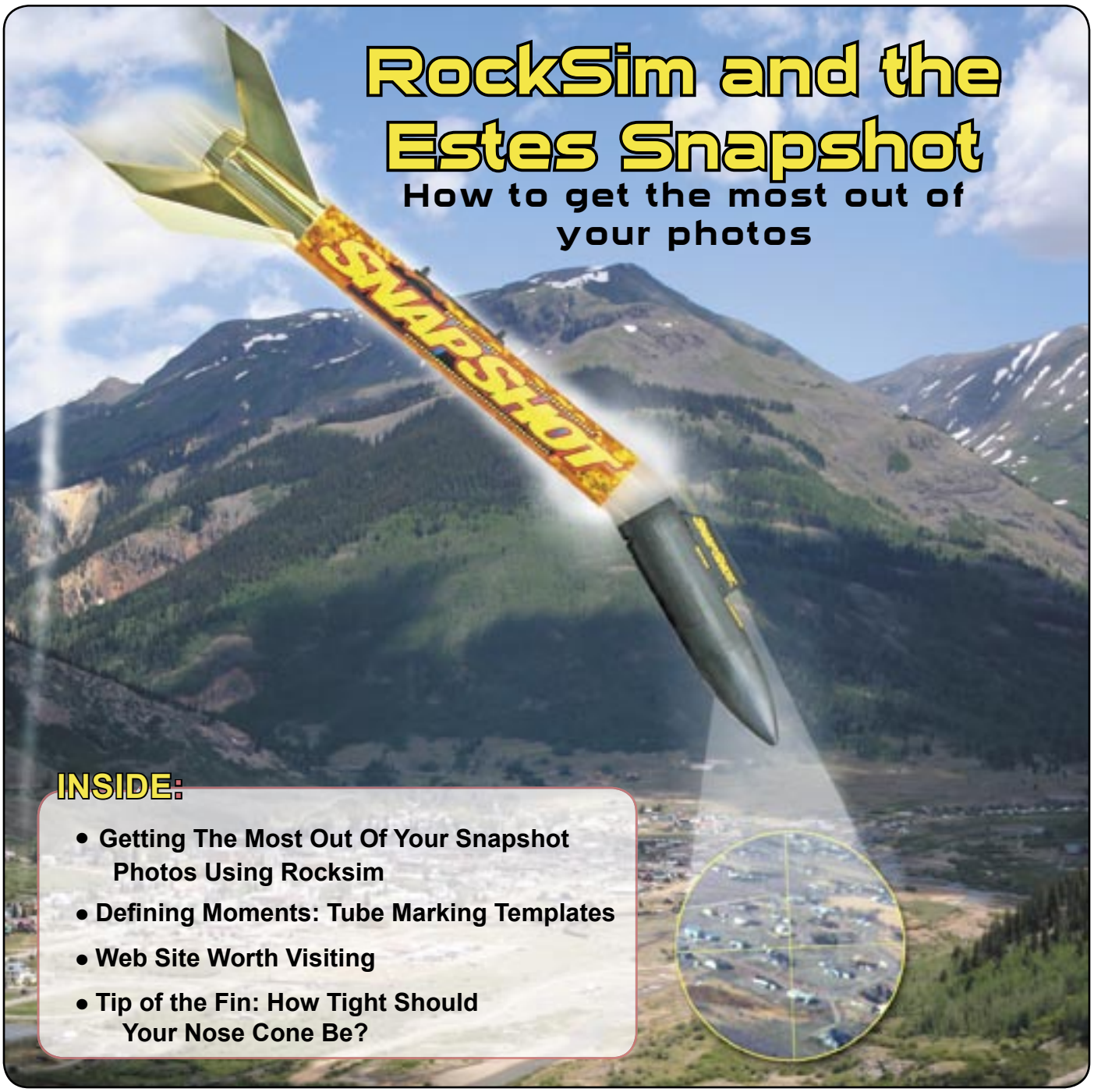
ISSUE 178 - FEBRUARY 27, 2007

APOGEE PEAK OF FLIGHT NEWSLETTER



RockSim and the Estes Snapshot

How to get the most out of your photos

INSIDE:

- Getting The Most Out Of Your Snapshot Photos Using Rocksim
- Defining Moments: Tube Marking Templates
- Web Site Worth Visiting
- Tip of the Fin: How Tight Should Your Nose Cone Be?

Apogee Components

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What can you do with your Snapshot?

by John Manfredo

The Estes Snapshot® Camera Rocket is a jewel of a model to posess. The possibilities are endless as to what can be achieved when this model and RockSim are combined together.

Start with the basics

Let's start by looking at the Snapshot® rocket and identify the main things that you need to know about the model. This model is the third in a line of model rockets made by Estes to perform picture-taking from on high. The first was named the Camroc®, the second was called the Astrocam®, and the third is the Snapshot®. There have been different modifications over the years and the latest seems to be the best design to date.

Picture 1

As seen in Picture 1, the film cover comes off fairly easily with a small screwdriver or something similar. Although one roll of 110 film comes with the kit, can buy extra film made by from. After the film is placed in the nose cone and the cover is replaced, the shutter release tab is pulled back (see Picture 2). As you hold the tab with one hand, you will need to push in the button that will hold the tab in place. This button is located on the side opposite of the lens cover outcropping as seen in Picture 3.

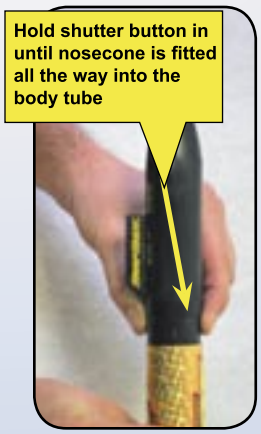
Finally, assuming that you have already inserted the parachute and shock cord, the nose cone is placed back into the body tube while the button remains depressed as seen in Picture 4. Once the nose cone is in, it will hold the button and tab in place until ejection occurs.

Picture 2

Picture 3

Incorporating RockSim

Now that the rocket is all prepped, the decision needs to be made as to what motor to use. To begin with, let's decide what kind of picture is wanted. For the first picture, I wanted to keep the rocket low and see what the terrain would look like at a fairly vertical angle.



Picture 4

The first simulations

I ran simulations in Rocksim, and with an A8-3 motor it predicted the model would stay under 100 feet and then take the picture

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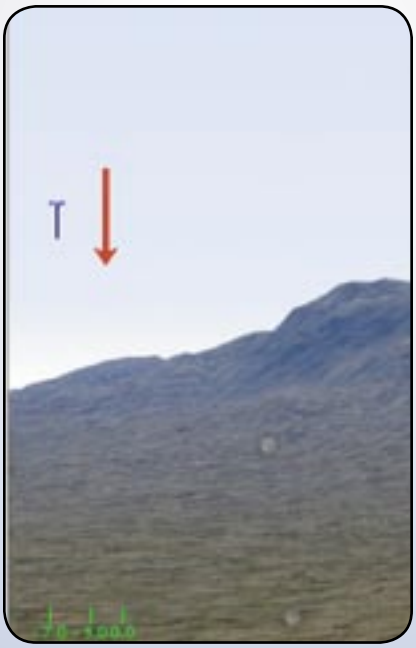
fairly low to the ground. Coming to these results is just a matter of tweaking the delay and running the 2D Flight Profile until the desired angle is achieved in the animation (see Picture 5). If the rocket shows ejection before the angle you want, simply set a longer delay or shorter if the ejection happens after the angle that you want. The result of the first photo taken is seen in Picture 6. I was able to capture the road that is in front of my house and a little of the surrounding terrain in a fairly concentrated area.



Picture 5

Picture 6

Second time around

For the next photo I wanted to try to catch more of the surrounding area, but still keep the rocket

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Picture 7

pretty low, so I chose a B6-4 motor in RockSim. Photo 7 shows that the rocket's angle is not quite vertical and the model is higher when ejection occurs. Using the slider bar in the 2D Flight Profile helps pinpoint the location of the rocket when it ejection happens and the rocket takes the photo.

The resulting photo from this simulation are seen in Picture 8 below. I was able to get our neighbor's driveway, which is a half-circle in the frame along with some of the white fence that they have in front of the street. It came out pretty nice and I was happy about the results, but the type of photo I was after was actually one that was from a higher altitude and that showed off the surrounding land area.

A view from on high

In order to set this type of photo angle up in RockSim, I needed to find a motor/delay combination that would allow the rocket to be oriented at an angle which would cause ejection at just past apogee. This would get the surrounding territory and horizon in the photo, which was what I was after.

Picture 8

I figured that to get the altitude I wanted I would need to use a C-size motor. The delay was something that I just started playing around with in RockSim; adjusting it and viewing the 2D Flight Profile until I achieved the angle I needed. As seen in Picture 9, I finally found that a C6-5 was the ticket!

The red arrow shows that the angle of the model at ejection is just past horizontal and apogee. In Picture 10 you see the results from this flight. It turned out better than I expected! In the upper right corner is the horizon with some blue sky showing. The surrounding area has the neighborhoods around my house with roads clearly visible, including trees and houses.

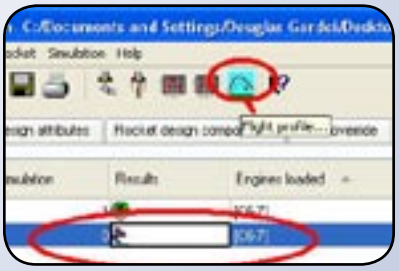
Picture 9

Picture 10

For fun and education

What if you know the spot on the ground you want to photograph, and you want to figure out if you can actually take a picture of it using the Snapshot rocket?

Douglas Gardei (primary) and Bob Cox collaborated on a nifty calculator that will calculate the image taken by the rocket based on its altitude and angle of deployment. You'll find it at: http://www.rocketreviews.com/virtual_contest12sup.shtml.



Picture 11

After running your simulation in Rocksim, select the simulation and click on the 2D profile button as seen in Picture 11. Once the simulation reruns and you see the simulated flight profile window,

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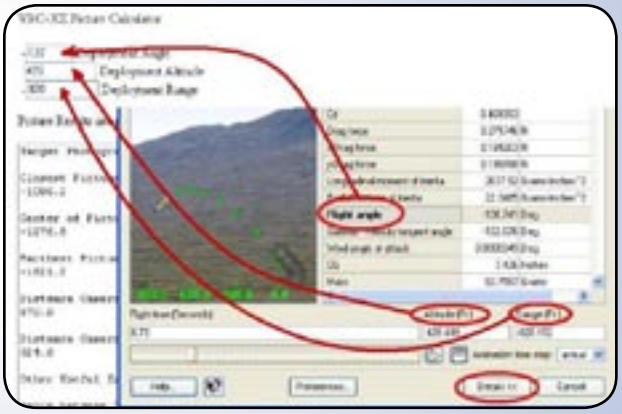
Picture 12

use your mouse or arrow keys to slide the Flight Time slider to just before Rocksim tilts the model perpendicular to the ground. You can also type in the exact time before ejection (seen in Picture 12). Last, click on the Details button and scroll down till you see "Flight angle." This is the Deployment Angle. You will see the altitude displayed right of the Flight Time slider. It is important to note that even though the Flight Angle and Range values are negative, you need to enter them in the calculator as a positive value as eeen in Picture 13.



Picture 13

About the Author

John Manfredo is the Education Coordinator and Newsletter Editor at 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.

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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!

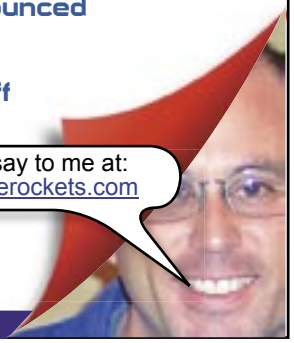
The grant winner will be anounced on January 1, 2008.

What a great way to start off the new year!

Send your essay to me at:
johnm@apogeerockets.com

Or send to:

1130 Elkton Drive Suite A
Colorado Springs CO 80907



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

TIP OF THE FIN

The tip for this issue is on how to tell if the nose cone on your rocket is fitted properly. You want to ensure that the nose cone is not too tight or too loose.

If it is on the loose side, then it may slip out before ejection and if it is too tight, the parachute may not deploy at all. Gravity would definitely be the rocket's enemy.

In order to test if the nose cone is too tight, pack the parachute as you would normally. Then hold the aft end of your model to your mouth, fit your lips tightly on the end, and blow hard! This will simulate the pressure that occurs during motor ejection. If you blow and the nose cone stays, but your eardrums pop, you've got the nose cone too tight! In order to fix this problem you can sand down the shoulder a bit. As you do this, you will need to keep checking for too loose of a fit, as described in the following paragraph.

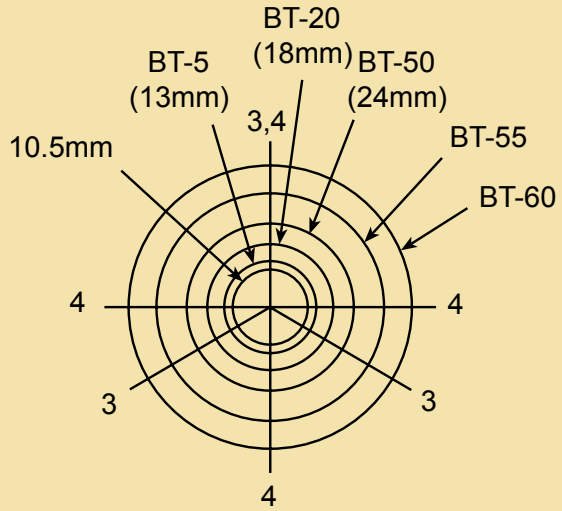
To check if it is too loose, simply pack the parachute again and hold the rocket by the nose cone in a vertical position. If the rocket body slips off of the nose cone under its own weight, then the nose cone is too loose. You can fix this by wrapping some masking tape around the shoulder.

DEFINING MOMENTS

A ***Tube Marking Template*** is a simple guide that allows you to make marks on the body tube of a rocket where the fins are to be attached. You will see one of these in the illustration on the right.

It is handy in the sense that it allows the modeler to make fairly accurate and even spacing around the tube so that the fin look and function is more precise and useful. Since most typical models have either three or four fins, you use the fin guide to mark the end of the body tube. Then you line the tube up on a door jam or aluminum angle and draw a line at least half the length of the tube. At that point you will have lines for the fin locations that will be long enough so you will be able to place the fins in a way that they are straight on the body tube.

For your scratch-build needs, please visit http://www.apogeerockets.com/building_supplies.asp for the building supplies you want!



Tube marking template for 3 or 4 finned rockets

Tube Marking Graphic from Model Rocket Design and Construction www.apogeerockets.com

Question & Answer

A question that comes up now and then is "What is a LEUP?" LEUP stands for Low Explosives User's Permit. Low Explosives User's Permits are managed by the B.A.T.F. (Bureau of Alcohol, Tobacco and Firearms) and are required for purchase across state lines, storage or transportation of high-power rocket motors.

Ammonium Perchlorate Composite Propellant (APCP) is on the official ATF list of explosives. It is classified as a “low explosive”. Consequently you need a “Low Explosives User’s Permit (LEUP) to possess a rocket motor using APCP. However, the ATF has exempted motors that use less than 62.5 grams of propellent from requiring a permit. All “H” impulse motors and above use more than 62.5 grams of propellent as well as some F and G impulse motors. If you are using solid motors of H or above, you will need a LEUP.

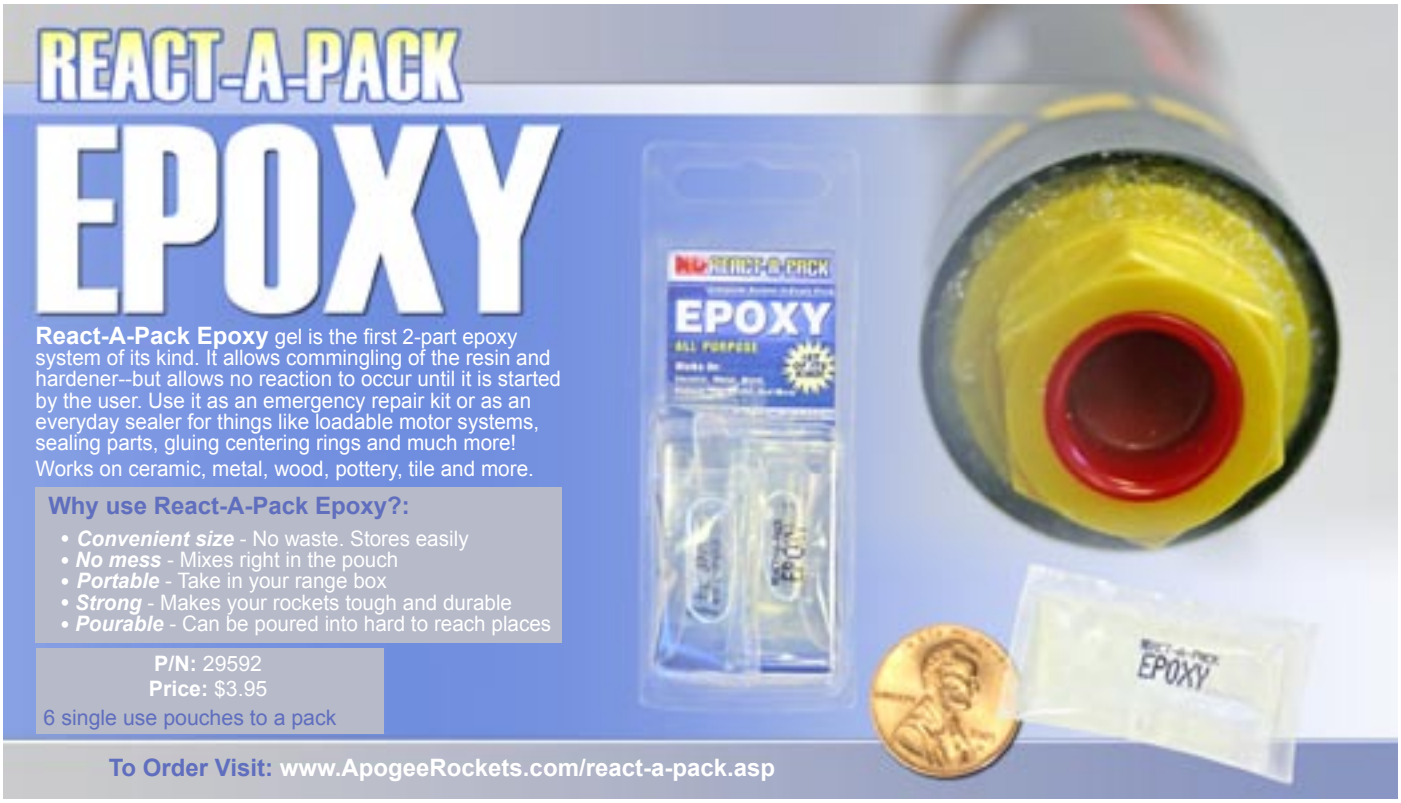
What is the process of getting a LEUP? Basically, it involves filling out a bunch of paperwork for the federal government. You can get some additional background information on the process at these web sites:

http://www.marsclub.org/new1/LEUP_Info/leup_info.html
http://www.tulsarocketry.org/LEUPTutorial.htm

Customer Comment

My order was perfect as usual. Ordered on Friday morning, received the package Saturday. That’s awesome in my book. The package arrived in great condition. I really appreciate your fast service, and your commitment to super customer service puts your business in a league of your own. Of all the online purchases I make, I mean all of them, your web site is the most helpful and easy to use. Keep up the great work. I’ll always be a customer of yours.

Thanks, Jim Dunwoody



Web Site Worth Visiting

The website of the week is in celebration of the first man in space. Everyone is having a party to celebrate this moment in history! Go to http://www.yurisnight.net/2007 and have a little party of your own. "Let's Go!" were the words spoken by Russian Cosmonaut Yuri Gagarin as he embarked on the historic first manned space flight on 12 April 1961. Twenty years later on 12 April 1981, the US launched the first space shuttle flight.

The site states, "We think that's something worth celebrating – so we do!" Every year on April 12th Yuri's Night is celebrated all around the world – last year there were over 90 events or parties held in over 30 countries worldwide - and 2007 looks set to be even bigger. The range of events is as diverse as the people who hold them – even the residents of the International Space Station have been known to join in the fun!

Whether in someone's living room, a swinging nightclub or a world-class science museum, Yuri's Night events all have one thing in common - people who are excited about space exploration and who want to join together to celebrate it. Check it out and join in on the fun!