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APOGEE PEAK OF FLIGHT NEWSLETTER

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Apogee Components
1130 Elkton Drive, Suite A
Colorado Springs, Colorado 80907 USA
www.ApogeeRockets.com e-mail: orders@ApogeeRockets.com
phone: 719-535-9335 fax: 719-534-9050

"Is the Doctor In?" - Dr. Zooch Speaks

by Wes Oleszewski
(edited by John Manfredo)

Without RockSim, there would be no Dr. Zooch Rockets

Often I get comments from amazed customers who wonder just how it is that my Dr. Zooch ant-scale Saturn V kit manages to "fly like an Alpha." My answer is always the same, because I normally say that the thanks should go to RockSim. This is also true of my personal thanks. Without the help of RockSim, the four kits (that made up the foundation of the entire Dr. Zooch Rockets Company) could not have been produced in the sort of time frame that made the company happen. This is because a protracted period of trial and error test flying would have been required as opposed to the "all-up" certification flights that were actually used. You see, RockSim allowed almost all of that trial and error testing to be done in my computer.

Dr. Zooch Rockets actually had its seeds planted in January of 2004...

The Beginning of Dr. Zooch

Dr. Zooch Rockets actually had its seeds planted in January of 2004 when I was working on a clone of the old Estes K-39 semi-scale Saturn V. Being a person who loathes clear plastic fins, I began to ponder the question of just how small the fins for a rocket of the K-39's similar build could be. With that in mind I e-mailed Tim Van Milligan, who is the owner of Apogee Components, Inc. and a long-time friend of mine from college. As a well-known model rocket expert he was able to give me the single best piece of advice that I could have gotten. He simply directed me to download the trial version of RockSim from his web site (http://www.apogeerockets.com/rocksim_demo.asp) and put my design measurements into it. In short order I discovered that not only was RockSim highly user-friendly, but also that I could trash the clear plastic fins on this rocket and do a number of things that would improve on the design.

My Background

For someone such as myself, who is not only a B.A.R. (born again rocketeer) from the 1970s, but also a former airline captain (which means I'm not good with computers or engineering math), my first few hours with RockSim were almost addictive. Out of those late night sessions came the idea that I could produce a version of the semi-scale Saturn V that was totally my own. It would be the model that I had envisioned back in 1970 when I finished my Estes K-39 and realized what they meant by the term "semi-scale." Additionally, I came to the conclusion that I could mass-produce my model as a kit and let other folks have fun building and flying it.

Gathering Momentum

Over the next five months I worked on instructions, packaging, and sources of parts for the ant-scale Saturn V, while I ran the design through every sort of configuration and weather condition in RockSim. Prior to the first actual flight of the prototypes, the ant-scale Saturn V had done over 200 simulated flights in RockSim. The fin sizes were altered until the optimum for both appearance and performance was found. Likewise, the location of the fins was adjusted and tweaked. The shapes of the adapters were also altered time after time to fall into the optimum for performance and appearance.

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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
Proofreaders: Michelle Mason and Brandy Jones

Saturn V in RockSim

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Most important of all, however, was the shifting and sizing of the ballast weight. That task alone made the difference in how the final product performs, even today.

Tweaking the Design for Weather Conditions

Then there was the consideration of the variability of weather conditions. As a life-long professional pilot, I knew that the conditions of the air mass in which the rocket would travel would mean a lot, especially when the margins of stability that I was designing into the kit were so slim. I had to know how much the weather conditions would affect this kit. I did not want to test fly it at sea level and have it work fine, only to have to worry about customers flying it in high elevations like Denver.

Likewise, if it worked well in Michigan on a calm summer night, how would it fly in Texas on a blustery, ultra-hot summer day? This may sound silly to the casual reader, but to someone who is going to be selling these things in mass, such concerns for customer satisfaction can be nagging issues. RockSim answered those questions and allowed me to set up some pretty wild conditions just to make myself feel better.

Saturn V prototype

Saturn V Nozzles

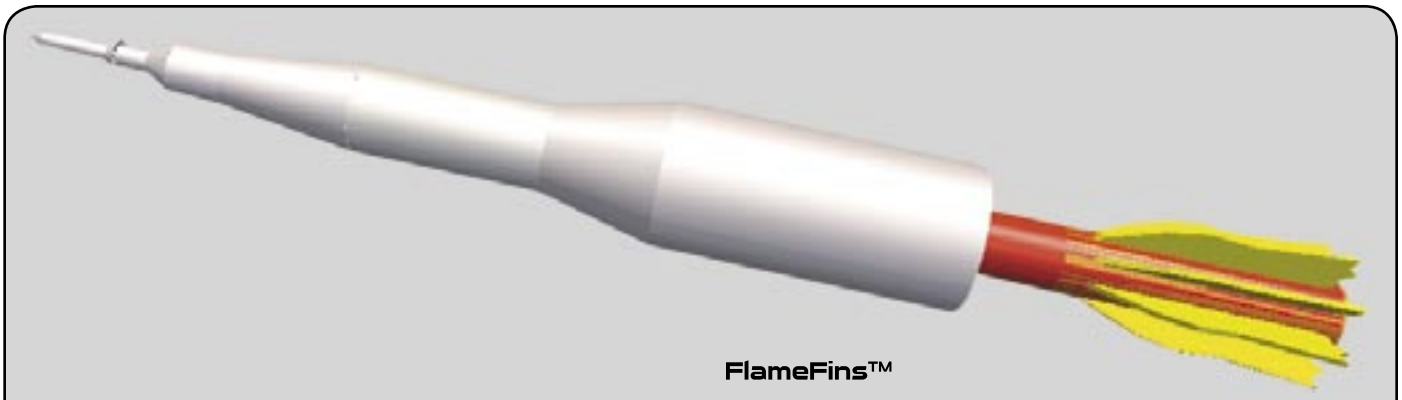
Test Flights

It was a hazy June evening in mid-Michigan when I tested the first two prototypes of my ant-scale Saturn V. I used my old rocket flight test range from my pre-college days…my parents' backyard. I wanted a secure location that would be private, just in case all of my work proved to be wrong and the rockets went silly on me. With my brother helping, we fired and lost both rockets. This was not because of instability or any other factor of that sort. It was due to the fact that RockSim said a C6-7 will send the rocket 988.88 feet up at 317.28 feet per second into a thick, late evening summer haze. That's exactly what happened.

Of course we saw that both rockets were highly stable during the boost, but having not launched a model rocket in 25 years, my judgment as to what the RockSim figures actually translated into was way off. We did catch a glimpse of the silhouette of one of the rockets descending in the distance, but it was too far off to bother

Saturn V Test Flight

continued on page 4



FlameFins™

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tracking down in the evening darkness. None of that mattered though, because I knew I had a winner for my first kit. A few weeks later I tested a production model Saturn V in public at the Maryland Delaware Rocketry Association's monthly launch with terrific results.

Dr. Zooch

Saturn I, Block II

Adding to the Line

In parallel with the Saturn V, I had also been using RockSim to design three other kits for the introduction of Dr. Zooch Rockets. Two versions of the Saturn I, Block II were designed and simulated, as was an Apollo Saturn IB. These all went through the same design and RockSim trials that the Saturn V went through with a bit less paranoia on my part.

At NARAM 2004 I began selling the kits and the Dr. Zooch line of rockets was off to a great start. Today I still use RockSim as one of my most important design and production tools. My Space Shuttle kit is the only rocket in the line that does not have its design rooted in RockSim.

Even the paper adapters used in my kits are custom designed here at my desk using RockSim. My latest innovation, FlameFins™, was first tested in RockSim before becoming a part of the Titan IIIC, the Ares I and the upcoming Juno II and Mercury Atlas kits. RockSim is the most useful tool I have other than my hobby knife.

Chan Stevens: photo of my C-5 kit that he built

About the Author

Wes Oleszewski is a former airline captain who now owns and operates Dr. Zooch Rockets (http://www.klydemart.com/newrockets.html). He started his rocket madness in 1969 at age 12 and put it aside just long enough to go through college and have an airline career. He came back into rocketry in 2002, composing a series of spaceflight CD-ROMs and then transitioned into designing and selling model rocket kits. He lives in the Washington DC area and also works as an editorial cartoonist.

Wes and Apogee Components' owner, Tim Van Milligan are good friends, as they both attended Embry-Riddle Aeronautical University, and were teammates on the student newspaper, *the Avion*. Wes was the cartoonist, and Tim was the advertising manager as well as a staff reporter.

Web Sites Worth Visiting

In this issue of *Peak of Flight,* we honor the crew of Apollo 1 at the ***Apollo 1 Memorial Foundation*** web site, which can be found at http://www.apollo1.org. Any of you who remember this disastrous event will undoubtedly appreciate the facts found here. The mission of this site is *"To commemorate and celebrate the lives of Virgil Ivan "Gus" Grissom, Edward White II, and Roger Bruce Chaffee who lost their lives in a tragic fire at Launch Complex 34 (LC 34) on 27 January 1967 and made the ultimate sacrifice that we may succeed in mankind's greatest adventure."*

They also want to "educate the public about the U.S. Manned Space Program through their preservation and educational efforts and by sharing the story of man's historic ventures into space. In addition, they would like to encourage future generations to continue boldly carrying the torch of space exploration which has been entrusted to them by those brave souls who first helped this nation chart a course to the stars."

Quoted from the website: *"Without men such as them, our country would not have made it to the moon within the time frame designated by President John F. Kennedy's challenge in 1961, and the political repercussions could have led to the Soviet Union's dominance of space. It was strongly felt at the time that the program had to be continued in the crew's memory and our country benefits from that decision in the technological transfer of so much that was learned during the program."*

A little-known fact is this: There is a formation on the far side of the moon called Apollo. Within that formation are three craters:

CRATER CHAFFEE: 39° South Latitude, 155° West Longitude

CRATER GRISSOM: 45° South Latitude, 160° West Longitude

CRATER WHITE: 48° South Latitude, 149° West Longitude

On July 20th, 1969, Apollo 11 landed on the moon, the first time in history mankind has stepped on another celestial body. They left there, on the Sea of Tranquility, the Apollo 1 mission patch.

A special page that will take you back in time is the Audio and Video file page. You will be able to see and hear momentous occasions such as Apollo 8's Christmas Eve transmission, the Apollo 11 Moon Landing audio, and video of John Glenn's Mercury launch and Alan Shepard's first launch. Enjoy this site!

Customer Compliment about RockSim

Greetings,

I would like to take a few minutes aside and thank you for this rocket simulator. By far its the best tool I have ever used, and there have been many. To be honest, I was skeptical... far too many claimed to be the "best" and the "most" available, but always fell short of their mark. Yours is the first to not only deliver, but exceed all promises as well as my own expectations. Now I'll know for certain that a new design will fly or crash, giving me more time at the launch site and more confidence at the workbench. This is a hobby to be enjoyed and that demands safety, something Rocksim provides to even the most computer-impaired among us due to easy-to-understand language and instructions.

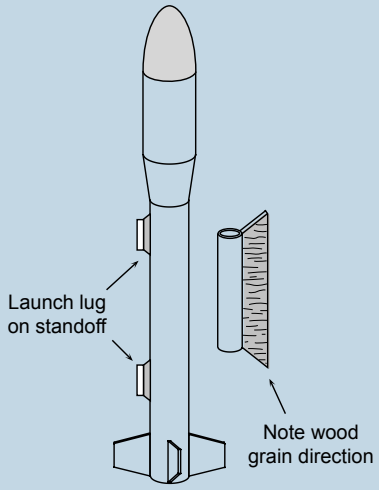
Thank you! Andy Laird

DEFINING MOMENTS

A **Launch lug standoff** is a pylon on which the launch lug is attached.

These are used on models where the diameter of the nose is larger than the rest of the rocket. On some designs the nose of the rocket may interfere with the placement of the launch lugs. In these cases, mount the lugs on short pylons so the launch rod will clear the nose.

To prevent the pylons from splitting in half, make sure the grain of the wood runs perpendicular to the centerline of the model as shown in the illustration to the right. A real-life application of this would be the Quest Courier rocket, which you see below and will find at http://www.apogeerockets.com/quest_courier.asp.



Standoffs are used when the front of the model is larger than the rear

Launch Lug Standoff Graphic from Model Rocket Design and Construction www.apogeerockets.com

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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!

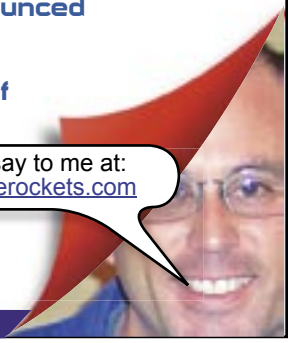
The grant winner will be anounced on January 1, 2008.

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

Motor failure in reloadable rocket motors is uncommon, but it does occur sometimes due to a defective part or casing. But more often than not, failures can be traced to simple operator error. The most common cause is loading the motor incorrectly or leaving out parts.

Every part in a reload kit is important. Be sure that you load the motor in an uncluttered environment and double check to see that you have used all the parts. An "O-ring" left out can cause disastrous results in the motor and the model. Allowing grease to get on the propellant or delay grains can cause the delay to not ignite and therefore no recovery device is deployed and the model will be ruined by the sudden deceleration from "ground impact".

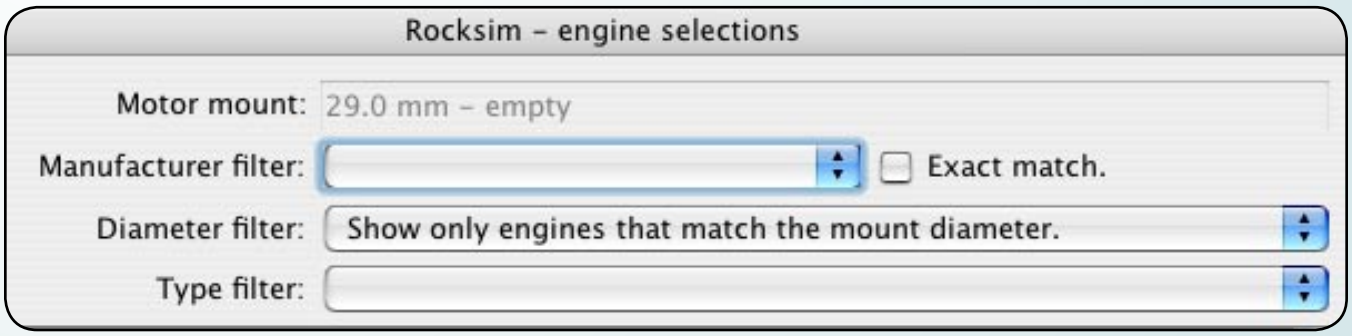
If you would like to get into reloads, read and follow all the steps so that you don't miss any critical points. We have reloads available for shipping without a Hazmat fee at http://www.apogeerockets.com/Aerotech_Reload_Motors.asp and their respectable casings at http://www.apogeerockets.com/Rouse-Tech_Motors.asp.

This tip taken from ***Modern High Power Rocketry 2*** at http://www.apogeerockets.com/Modern_hpr.asp

Question & Answer

For our question this issue, Michael E. Montie writes, "I went to run a simulation, went to “Choose engine” to select an Estes engine from the Estes manufacturer site, and no engines appeared. I had to use the blank thing instead of the specified manufacturer in order to find the Estes engines. Is that a bug with this version?"

This is no bug; you have to have the motor selection settings correct. Sometimes people will try to alter the default settings, which is not the way to go. When going to select a motor, make sure that the settings look like the picture below:



Make sure that the Manufacturer filter is blank, the Diameter filter is set as shown, and the Type filter is left blank. This way, the only motors that will show up will be the ones that fit that particular motor mount tube.

If you have a question that is rocketry-related, please email me at johnm@apogeerockets.com.

NARCON Memories

NARCON is the ***N**ational **A**ssociation of **R**ocketry's* annual rocketry ***CON**vention*. The event is for modelers of all abilities, and is designed to teach how to become better modelers. It has workshops for those people who are just getting started, and up to how to go about conducting an advanced Level 3 high power project. This year, it was held in Rochester, Minnesota.

Tim Van Milligan represented Apogee Components this year and conducted a workshop on how to use RockSim (http://www.ApogeeRockets.com/rocksim.asp). Nearly everyone in the room had used the program, so the presentation took a turn away from being an introduction, and covered some of the more advanced features of the software like how to set up a dual-deployment recovery in the rocket simulation.

Since the presentation occurred right before lunch, Tim's presentation was extended by popular demand, and he was able to show off the new RS-PRO software. This software has all the features of RockSim, but takes simulations to a whole new level - 6 Degrees of Freedom (6-DOF), and much higher altitudes and rocket speeds. This makes it useful for university experiments and semi-professional organizations that want to fly high-suborbital launches. For more information on RS-PRO, you can visit: http://www.ApogeeRockets.com/rs-pro.asp.

Tim Van Milligan

NARCON is a load of fun, and if it makes a stop in your state next year, we definitely recommend attending. You can get more details about NARCON at the NAR's web site: http://www.nar.org.