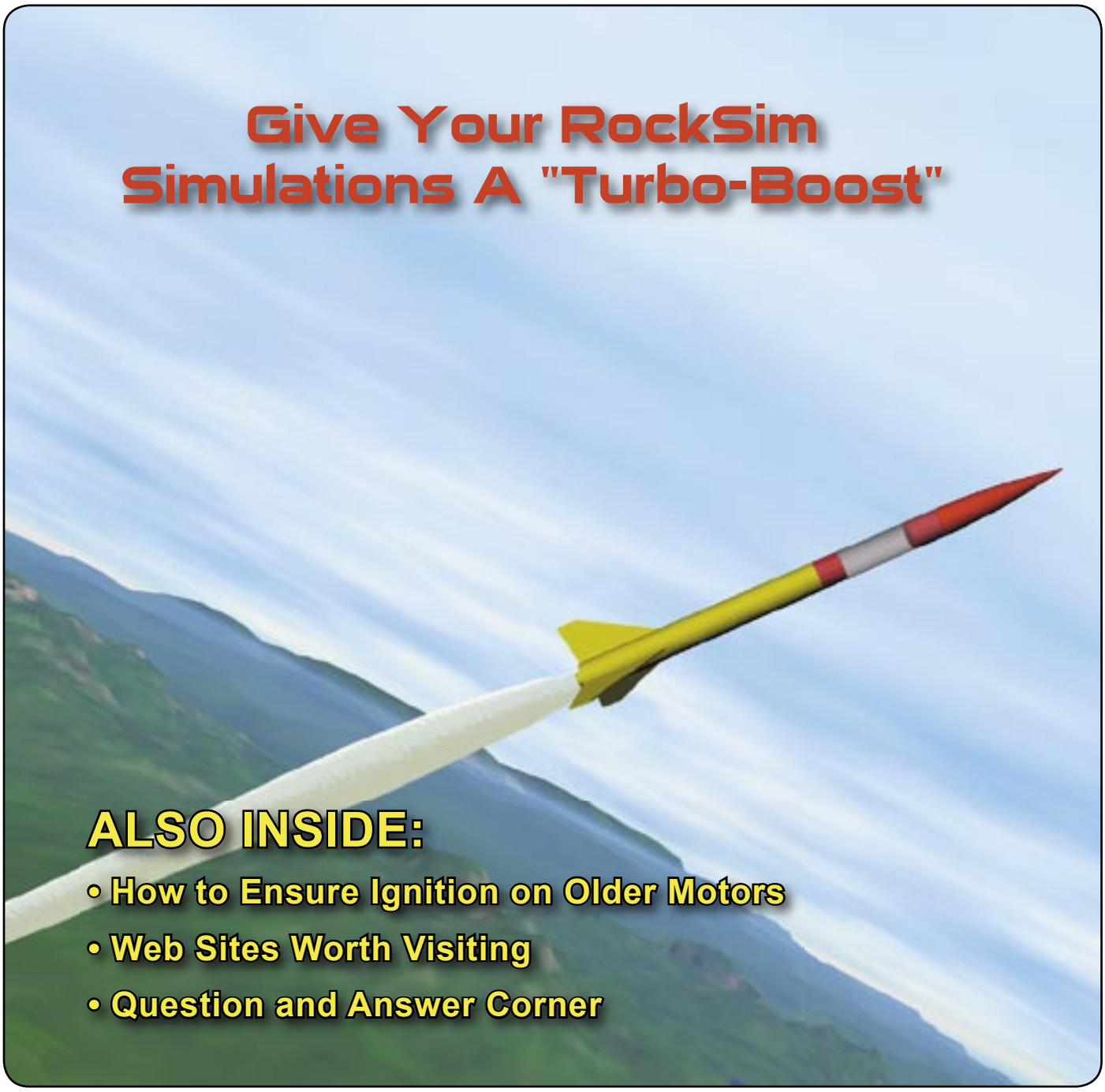
ISSUE 148 - SEPTEMBER 13, 2005

APOGEE PEAK OF FLIGHT NEWSLETTER



Give Your RockSim Simulations A "Turbo-Boost"

ALSO INSIDE:

- How to Ensure Ignition on Older Motors
- Web Sites Worth Visiting
- Question and Answer Corner

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"How to Speed Up Your 2D Flight Profiles"

By John Manfredo

Have you ever noticed when starting an animated flight in the 2D profile that it seemed like it took forever for the sprites and background to load? While it may seem to take longer to load on slower machines, you can speed it up a bit.

THE SOLUTION: CHANGE DEFAULTS

There are some ways that you can speed up your 2D flight profile animations. The loading and appearance of the flight profile screen is determined by the settings in the preferences dialog. The dialog divides the settings into logical groups. To begin with, open a Rocksim design file and click on a simulation. Then select the "2D flight profile" button which will start a "simulation progress" box. After the simulation is finished, the current sprites and background will start to load. You can click on "abort setup" a couple of times until you get to the animation screen as you can see in figure 1.

CHANGING YOUR PREFERENCES

At this point, go ahead and select the "Preferences" button which will take you into the "Flight Profile Preferences" screen. It is here that you will begin to make adjustments that, in the long run, will speed up the loading and speed of the simulations.

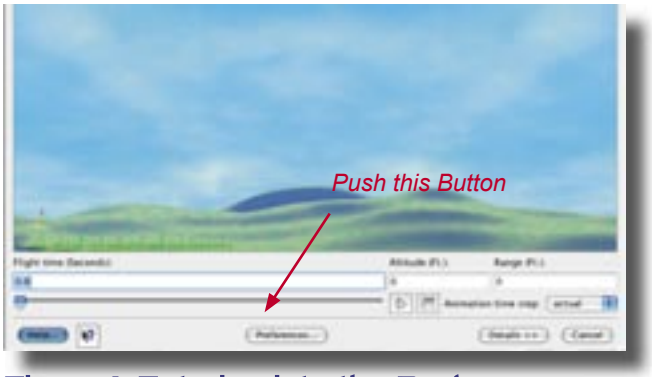

Figure 1 Entering into the Preferences

THE SIMULATION SAMPLE COUNT

On the "Flight screen" tab as shown in figure 2 you will see something labeled "Simulation sample count". The sample count is the number of simulation data samples used to create the flight profile. This value determines the resolution of the flight animation. Higher numbers yield finer detail in the flight at the expense of memory and processing

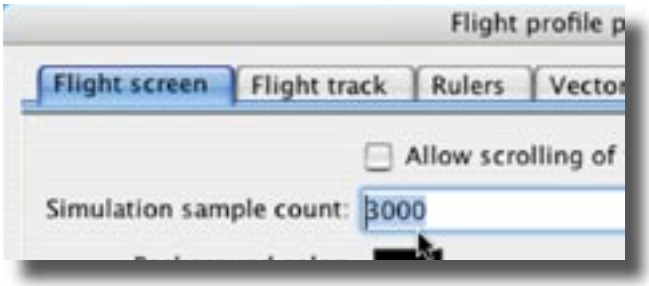

Figure 2: This means, it calculates the position "3000 times" during the flight.

time. This default value is set at 3000 samples. One of the ways, therefore, that you can speed things up is to change this value to only 1000 samples as shown in figure 3. Unless you are trying to gain a lot of insight into the details of every second and then some of your flight, this will not affect things very much.

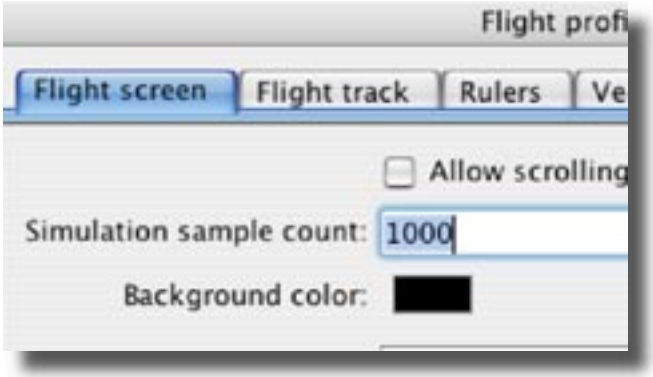

Figure 3: Lower the Sim Sample Count.

SPEEDING UP SPRITE CREATION

Now let's hop over to the "Rocket Image" tab and make a few adjustments there.

If the animations are not using your current rocket de-

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sign as the sprites, go ahead and check the box as you see in Figure 4. I mean, if you're going to do this, why not go all the way and make the rocket look just like your design! This will turn on the "Rocket animation image source information" boxes.

IMAGE ANGLE STEP SIZE

You'll start with the "Image angle step size". To explain this, there are a series of images created for each stage of the configuration. These images are the "sprites" that I

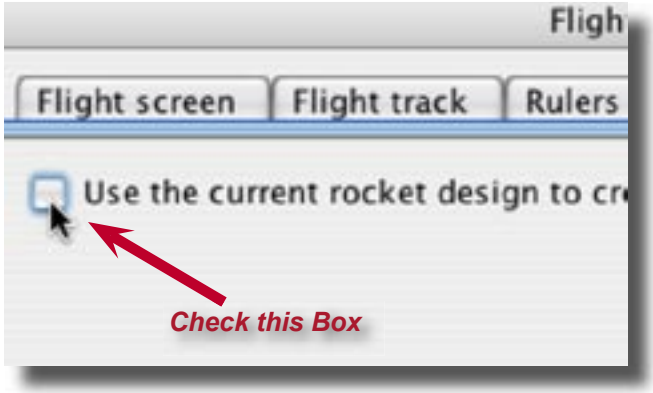

Figure 4: Check to Use Current Design

talked about in Newsletter Issue Number 146. The purpose of this is to render the images at various angles from 0 to 360 degrees. This angle step size determines the number of images created for each stage configuration. For example, a two-stage rocket will have a lot more images than a single-stage configuration. Values between 5 and 10 degrees are a good starting point. Smaller angle step values produce more realistic flight animations at the expense of memory and increased load times. An example of this is that an angle step size of 5 degrees results in the creation of 71 images per stage configuration, or to put it another way, it would create 71 little images of your rocket at all the conceivable angles of its flight. The default is 5 (shown in figure 5) so you are going to change this to 15 as seen in figure 6. This way, instead of making images of the rocket from every 5-degree angle, Rocksim will make an image every 15 degrees. Thus, overall, the total amount of images will be decreased.

IMAGE HEIGHT AND WIDTH

Next, we'll look at the "image height and width". These are the size of the sprite images that are generated in the form of pixels. Image dimensions of 128 x 128 for both height and width are the default starting points and seem to be a good place to begin tweaking things. By lowering these numbers to 100 x 100 the image loading will go a little quicker also. In figures 5 and 6 I have changed these figures.

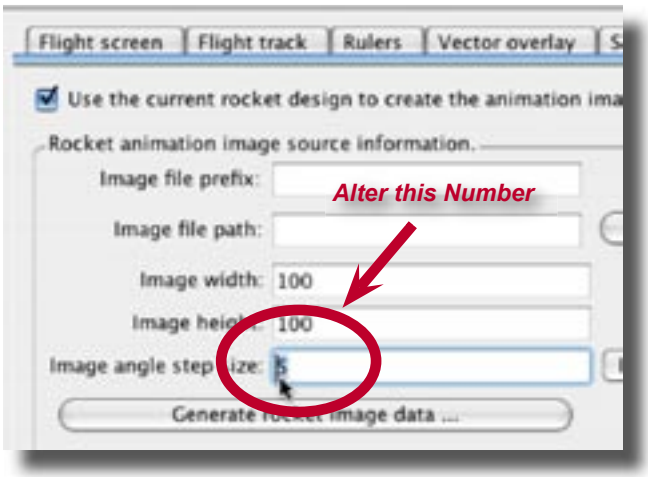

Figure 5: Default Setting is 5 degrees.

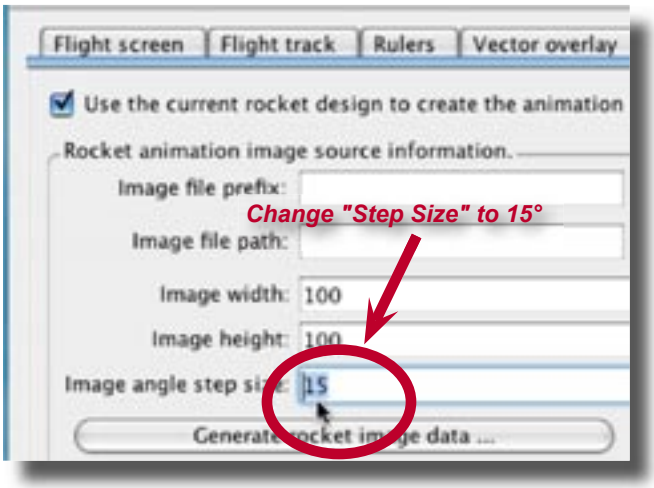

Figure 6: Change the increment to "15°"

Keep in mind that the actual size of the image on the animation screen will always be slightly smaller than this value.

As you can see in figure 7, save these sprites in the "media" folder or like you may have noticed, I chose to save them in a folder named "media1" so that the default sprites will be intact if I ever decide to rid myself of sprites. This way I don't accidentally delete the default sprites. This is totally optional, though. Also, please note that although this is shown on Macintosh, the selection of the destination in Windows will be similar.

As shown in figure 8, you should name the sprites after your rocket to make it easier to distinguish them from others that you may create. After you save the sprites click on the button that says, "Generate rocket image data…".

Continued on p. 4

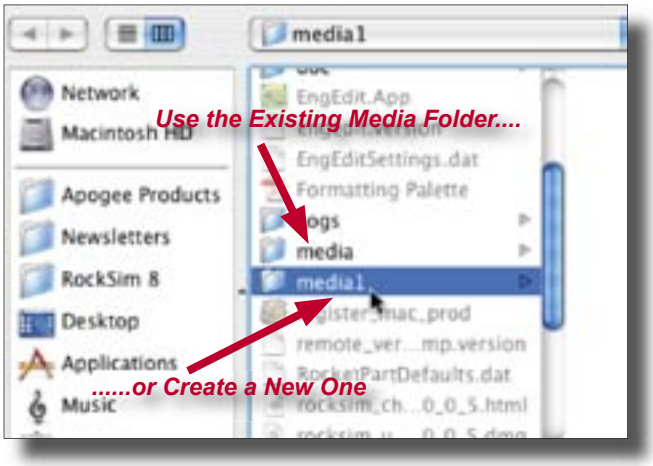

Figure 7: Choose the destination folder

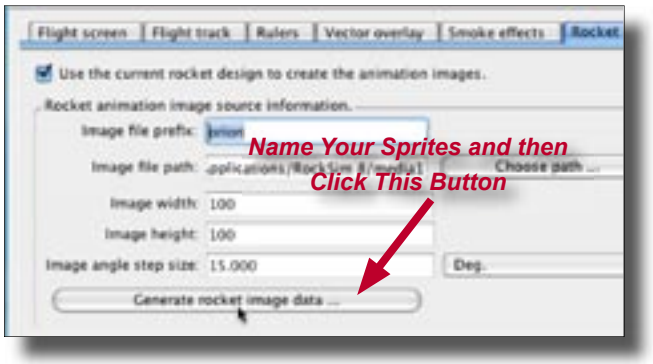

Figure 8 Name your design

Figure 9: Generation of a sprite image.

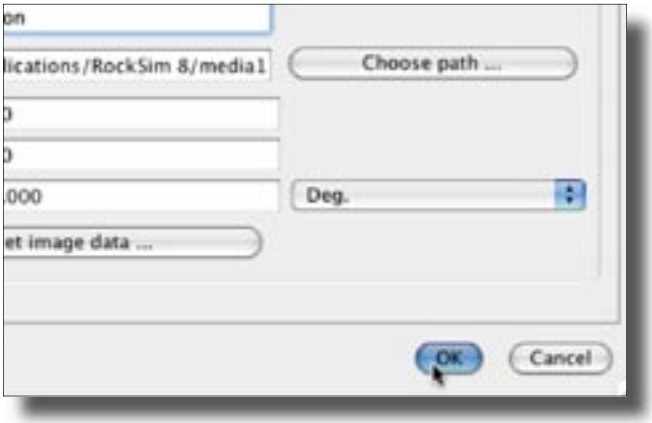

Figure 10: Click on "OK" to load Sprites

FINISHING UP

This will begin your generation of sprites, which will go a lot quicker than usual! This is seen in figure 9. Once the sprite generation is finished, click "OK" as seen in figure 13.

At this point, the animation images and background will load (faster, with any luck), you will be able to click the "play" button, and off will go your design also in a swifter fashion. Hopefully, this will help you get a little more enjoyment out of Rocksim. If you have never tried Rocksim and have no idea what I'm talking about, then please go to this link: http://www.apogeerockets.com/rocksim_demo.asp and try it for yourself for 30 days free! See why Rocksim is the preferred rocketry software for thousands of people, including the National Space Foundation!

About the Author

John Manfredo is the education coordinator at Apogee Components. He's Level 1 High-Power Certified, and has been building his own rockets for the last 30 years.

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ROCKSIM

WEB SITES WORTH VISITING

I came across a very nice website while "hanging-ten" on the web this past week. Jim Ballard and T.J. Tidwell's site, "Rocketdreemz", http://www.rocketdreemz.com/rocket_dreemz_001.htm is a really cool website in minimalist fastion that I feel it is a "no frills" site. Hold on, that is supposed to be a compliment!

By "no frills" I mean to say that it has interesting features make it worth the time to peruse through, but not so much information that it overloads the brain cells and causes those around you to wonder why smoke is coming out of your ears and not your rocket! Ok, enough of my attempt at humor.

To start things off, the home page displays a beautiful photo of Jim's "K" Factor under the full boost of an Aerotech K550W. They also have nice, big logos of NAR, Tripoli, and TARC. I really like the fact that they openly support and are out there for Team America. It's been a great event for kids all over the country.

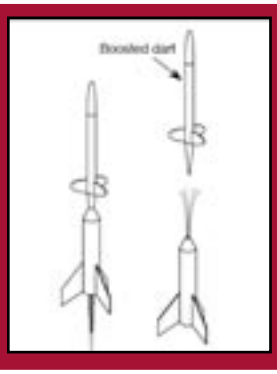
The navigational menu is nice and straightforward. The page called "Our Fleet" shows off some of their handiwork in a way that shows you the scale of the rockets. I like how they make separate sections for both Jim and T.J. to show the individual accomplishments of both of them. The page that shows T.J.'s Level 1 certification gives us a view of the nicely done L-1 rocket for this young man.

A variety of things are shown and described on the "tips" page including a tube jig designed with large tubes in mind and a simple, homemade altimeter test chamber! I've got to try that, guys!

The "tools" page shows a bunch of items I wish I had. There is a nice gallery of their rocketry endeavors as well as the standard "links" page that has a list several good sources of supplies. Take a look and add a bit more to your knowledge base. I know that I have learned a couple of new things.

DEFINING MOMENTS

A technique related to multi-stage rockets, is a special rocket design called a boosted dart. A boosted dart is similar to a two-stage rocket, but the top "stage" doesn't have a rocket motor in it. The bottom stage uses a conventional rocket motor with a delay charge, and not a booster type rocket motor. The unpowered upper portion; called the "dart," is smaller and more streamlined than the lower part of the model. After the rocket motor is done burning during the flight, the dart separates from the lower part of the model because its drag is lower. The small dart then coasts significantly higher than otherwise possible.



QUESTION AND ANSWER CORNER

How do you import an existing Rocksim design, that you found on the internet, into the program? Easy answer. Let's go through the procedure.

Let's say that you want to find a specific kit design file. Many vendors put the Rocksim files on their web-

Figure 1: Choose the LibraryFigure

sites, but if not, a great resource is to go to Essence's Rocket Review's website which can be found at http://www.rocketreviews.com. After the page loads, you will click on "RocksimLib". Then click on the link to "Kits." This will take you to a page that is full of choices as far as how you want to look for a design file.

Figure 2: Click "Kits"

For this example, scroll down to find the "Pratt Super Six" design. As seen below when you find your design, right-click on it and go to "save as" for Windows users and "download link to disk" for Mac users.

This will bring you to a screen where you will choose the destination folder. Although Windows and

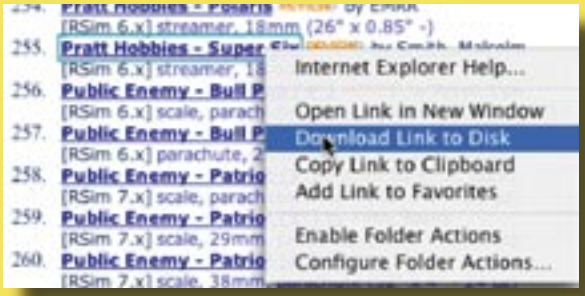
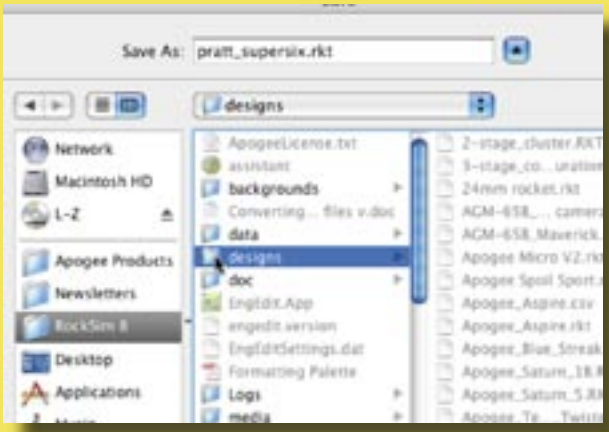


Figure 3: Right-click to Download

Macintosh look different, the folder will be the same. You can see the path for Mac below and for Windows you simply look in the "programs" folder and find the Rocksim program folder, which will have the "designs" folder in it. Left-click the "designs" folder and click the



Figue 4: Save the File into the Design Folder.

"save" button. You now will have this Rocksim design in the program when you start it again! The same procedure may be performed for any Rocksim design that you find. Keep in mind that designs created in older versions of Rocksim will not be compatible with version 8, so you will need to convert them. For more on this please see Newsletter 146 at: http://www.apogeerockets.com/education/downloads/Newsletter146.pdf

If you have a question, please feel free to send an email to me at johnm@apogeerockets.com

TIP OF THE FIN

I think we have all at one time or another had a misfire with an Aerotech “Copperhead” igniters. I would have to say that sometimes Copperheads can be tricky. See basic how-to information at http://www.apogeerockets.com/copperhead_igniter.asp.

In addition, sometimes there are more challenges with older White Lightening motors. You see, as this fuel ages it changes, which makes it more difficult to ignite. For example, in reload kits, you may have noticed what appears to be "white speckles" on older propellant slugs. Gary Rosenfield of Aerotech explains it this way: *"The effect is caused by an interaction between a metal fuel, Ammonium Perchlorate oxidizer and atmospheric moisture when the humidity rises over about 50%.*Basically, what they are recommending is that you store the reload kits where the humidity is low, and don't open the sealed plastic bag until you are ready to use the propellant. Otherwise it would be exposed to more moisture in the air.

Sanding the Inside of the Grain

If you use Copperhead igniters, I've found that there are a couple of things you can do to give yourself an improved probability of ignition the first time.

For example, if the motor is a White Lightening reloadable and has a “C” slot core, use a section of coarse sandpaper and run it lightly along the inside of the slot. This will rub away some of the white stuff and make the surface slightly "fuzzy". This increases the surface area, which makes ignition a lot easier.

Before Bending the Pyrogen Tip

After Bending the Pyrogen Tip

In addition, before you put the igniter into the motor, bend the pyrogen head of the igniter at its neck a little to increase the odds that the igniter head is touching the propellant (see the comparison pictures for "before" and "after"). If you are in the market for some igniters, see the following page: http://www.apogeerockets.com/Aerotech_motors.asp#First_fire_anchor . Or, if you simply just need some new motors to replace those old, tired, worn-out motors that have been around forever see our motor page at http://www.apogeerockets.com/rocket_motors.asp .

If you have a tip and we use it in this newsletter, we'll send you a HUGE 5-foot diameter parachute! Please send them to johnm@apogeerockets.com

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