ISSUE 140, MAR. 17, 2005

APOGEE PEAK OF FLIGHT NEWSLETTER

Hidden Features In The New RockSim V8

FREE Shrox Plan: "TwoNer"

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

ISSUE 140 - MARCH 17, 2005

APOGEE

PEAK OF FLIGHT

Hidden Features In RockSim v8

By Tim Van Milligan

Are there hidden features in RockSim v8? Well, they're not really hidden. It just may take you a little while to find them. So I thought that in this article, I'd point them out to you up front, so that you can take maximum advantage of them right from the start.

2D Zoom

In RockSim 6 and 7, it was easy to see that you could enlarge the 2D view to get greater detail. There was a magnifying-glass button on the bottom view window. While RockSim v8 beta currently doesn't have the magnifying-glass button, you can still zoom in on the 2D window. In fact, you can zoom in and enlarge the rocket to a much greater degree than with previous versions of RockSim.

The *hidden feature* in this case is that you have to use your mouse to zoom in. Here's how.

On Windows computers, use the right-click button on your mouse. Simply "right-click" with the mouse located anywhere on the 2D. This will bring up a "Context Menu" with choices to zoom in, zoom out, or zoom original (see Figure 1).

For Macintosh users (who don't have a 2 button mouse),

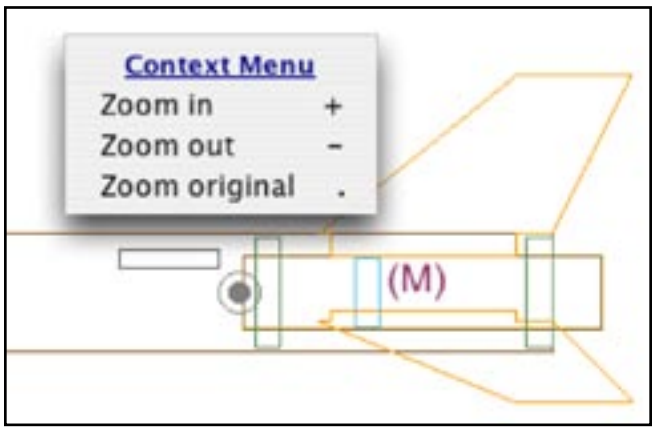


Figure 1: To zoom in on the 2D drawing, you first need to bring up the "Context Menu."

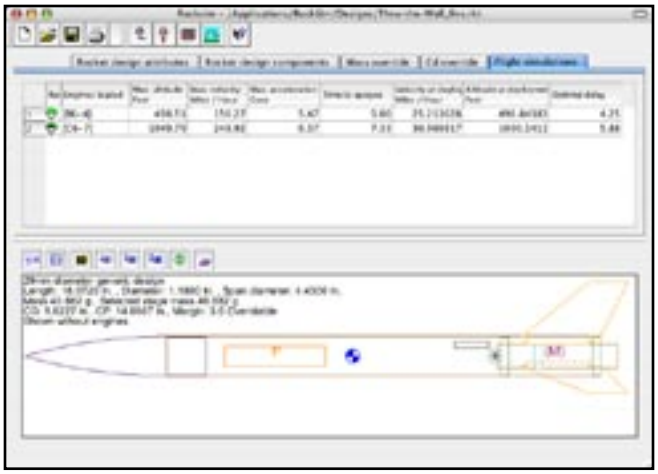


Figure 2: The main screen has been streamlined to free up more space for the rocket drawing.

you have to hold down the "cntrl" key on the keyboard when clicking with your mouse. This will bring up the "Context Menu" shown in Figure 1.

From this menu, make your choice to zoom in or out. You'll also notice some keyboard shortcuts in the context menu. For example, to zoom in, you would use the plus (+) key on the keyboard. Remember, the plus sign is in the upper case position, so you have to hold down the shift key to use the plus key.

The keyboard shortcut only works after you have brought up the context menu once. For example, say you wanted to really zoom in on the fins because you're adding through-the-wall tabs. So you bring up the context menu, and then you can hit the plus key. If you keep hitting the plus key, you'll continue to zoom in.

Once you are zoomed in, you'll probably want to move the image around so you can view the area of the rocket you're working on. To move the image around, click-and-drag it with your mouse. It is that easy!

When you're done, you can zoom back to the original

Continued on Page 3

About this Newsletter

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

Hidden RockSim Features

Continued From Page 2

size by selecting "Zoom original" from the Context Menu, or by typing a period on your keyboard.

2D Flight Profile Changes

One of the major new features in Version 8 is the totally revised 2D-flight-profile. This gives you an animation of the rocket's trajectory. I've found this feature to be invaluable in previous versions of RockSim. Now, it is a thousand times better because the rocket image is more realistic.

The first thing you'll notice is that it takes a few seconds to load. *Patience here... it is worth the wait.* You'll see why it takes a little longer for this screen to come up as you read further.

In this new version of RockSim, the previously plain-color flight-profile window is now filled with a great landscape picture. While the picture doesn't have anything to do with the trajectory of the rocket, your mind gets immersed into the context of a real launch setting. In other words, it sets the mood of attending a real launch.

We wanted RockSim to capture the excitement of a real launch because the 2D flight profile is such a powerful learning tool. There were a lot of people that weren't using it in previous versions of RockSim. I hope that by making it more realistic you'll use it more often. You see, the 2D flight profile animation gives you terrific visual clues as to what is going on with the launch. It can explain why the numbers on the summary screen may not initially make sense.

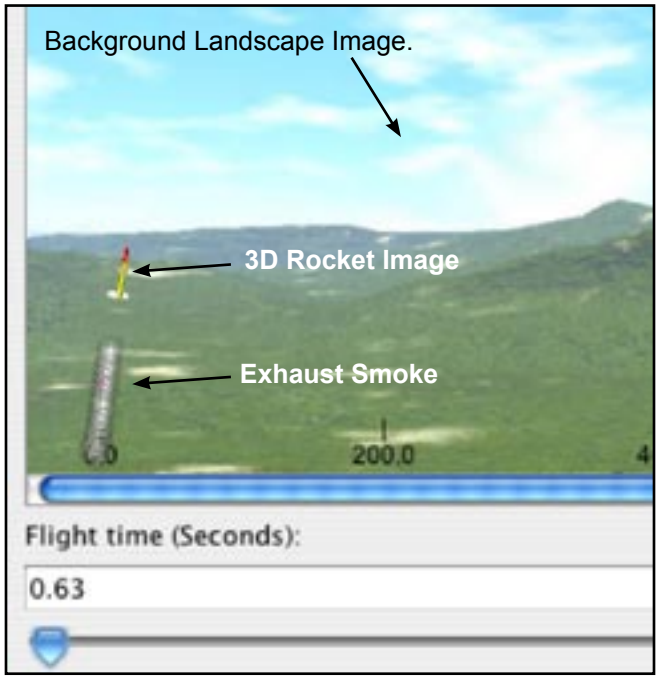


Figure 3: The Flight Profile screen was made much more realistic to capture the excitement of a real launch.

For example, say your seeing in the summary screen that the velocity at deployment is much higher than you're expecting. You can go to the 2D flight profile and see why. I ran a simulation the other day and the rocket didn't eject using the delay I expected. It turned out that I had over-ridden the delay by telling the rocket to deploy at 300 feet altitude. I had completely forgot that I had selected that setting; and the only way I figured it out is by looking at the 2D flight profile.

The stick-figure image of the rocket (seen in previous versions), is now replaced by a realistic rocket image. Again, this is to give you more visual clues as to what is happening with the launch. And later on in this article, I'll show you the hidden feature that will allow you to change this image to that of *"YOUR"* rocket design. But initially, RockSim displays a generic rocket, like the one shown in Figure 3.

You'll notice that the animation is set by default to run in "actual" real-time. This means that if your rocket takes 8 seconds to reach apogee in real life, the animation will match that speed. Clicking the start button will be like clicking the launch button on your controller.

HOLY SMOKES!

Once you click the "start animation playback" button, you're going to be blown away by the imagery. You'll see smoke coming out of the rocket, just like you'd see in real life! WOW!!!

I'm still blown away by this feature, and I've been playing with it for some time now. I can't get over how cool it looks, and that it actually gives you a greater amount of information about the launch. For example, you can get a better perspective comparing where the rocket engine burns out in relation to the final altitude of the model.

You also have some control over the smoke (click the preferences button on the bottom of the flight-profile window). Make it denser by spacing the individual puffs of smoke closer together, or change its color.

Why would you want to change the color of the smoke? Great question.

The reason we added a color feature is that when you are flying multi-stage rockets, things happen very quickly. It is often difficult to see where the first stage burns out, and where the next stage begins burning. By selecting a different

Continued on Page 4

Hidden RockSim Features

Continued From Page 3

color smoke for each stage makes it easy to see where one cuts off and the next stage begins burning.

You'll be blown away...

Notice that the smoke coming out of the rocket is not static. It expands and dissipates over time, just like it does in real life.

And this will blow you away – the smoke actually drifts with the wind. So the faster the wind speed you've specified in the launch condition settings, the quicker the smoke plume drifts across your computer screen!

The Rocket Image

OK, here is the hidden feature. And I want some feedback on how you like it.

You can have RockSim generate a picture of *YOUR* unique rocket design for use in the 2D flight profile. So instead of a generic looking rocket taking off in the animation, it will be a picture of your rocket.

Here is how you do it. First, click on the "Preferences" button on the bottom of the 2D flight profile window. This will bring up a preferences dialog of various features you can customize in the animation. From the tabs choices, select the tab labeled "Rocket image."

Figure 4: To create a animation of your design, use the rocket image preferences tab.

Once you click the checkbox labeled *"Use the current rocket design to create the animation images,"* the screen will change to that shown in Figure 4.

What you're doing is telling RockSim that you'd like it to generate an animation. So first, you need to tell RockSim what name you'd like to give it (the "image file prefix"), and where on your hard drive you'd like to save it. Clicking the button labeled "Choose path" does this.

Next, you need to tell RockSim how big to make the image on the screen. The default is 156 X 156 pixels. The bigger the image, the more space it takes up in the window, and it may not look proportional to the background picture. But the size it up to you.

The animation is made up of a series of images or frames, just like you'd have to draw if you were animating a TV cartoon. RockSim has to draw all the possible and conceivable orientations of the rocket, so once you click the "Generate rocket image data" button, it will bring up a little screen that shows a rotating image of the rocket. (see Figure 5).

Sprites

The little pictures RockSim is generating in this screen are technically called "sprites." This term comes from the video game world, and means it is drawing a little icon. Every time the rocket rotates, it is drawing a single movie frame (sprite), and storing it on the hard drive. The bigger the image size, the more space is used on your hard drive.

This is the part that takes some time. The rocket will appear to spin several times, as RockSim is trying to take into account every possible orientation of the rocket in flight. The

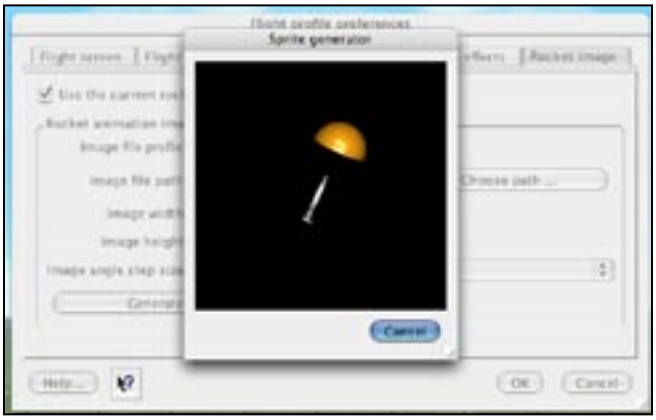


Figure 5: The sprite generator makes an image of the rocket in every possible flight-attitude.

faster your computer's processor, the quicker this process will go.

For example, it has to draw a picture of the rocket with a flame coming out, rocket going up without a flame, rocket tumbling down without a flame, and rocket with the recovery device deployed, etc.

Note: The color of the recovery device shown is the same color you specify as the 3D color of the parachute or streamer. How cool is that?

If your rocket is multi-stage, it will take a bit longer to

Continued on Page 5

Hidden RockSim Features

Continued From Page 4

generate the sprites, because it has to make pictures of the booster stage(s) attached to the rocket, and also tumbling to the ground.

The good news is that you only have to generate sprites one time for each rocket design. In other words, you DON'T have to do it every time you run a new launch simulation. RockSim will remember that you created sprites previously, even if you come back weeks later and run a launch simulation.

Once it is done generating the sprites, RockSim must figure out which of these *(of the hundreds of sprites)* it needs to use during the animation playback. This consumes a bit of time, and it is the reason why bringing up the 2D flight profile screen takes much longer than it took in version 7. The more complicated the launch (multi-stage, etc), the longer it will take to figure out which sprite frames it needs to use, and in what order to use them.

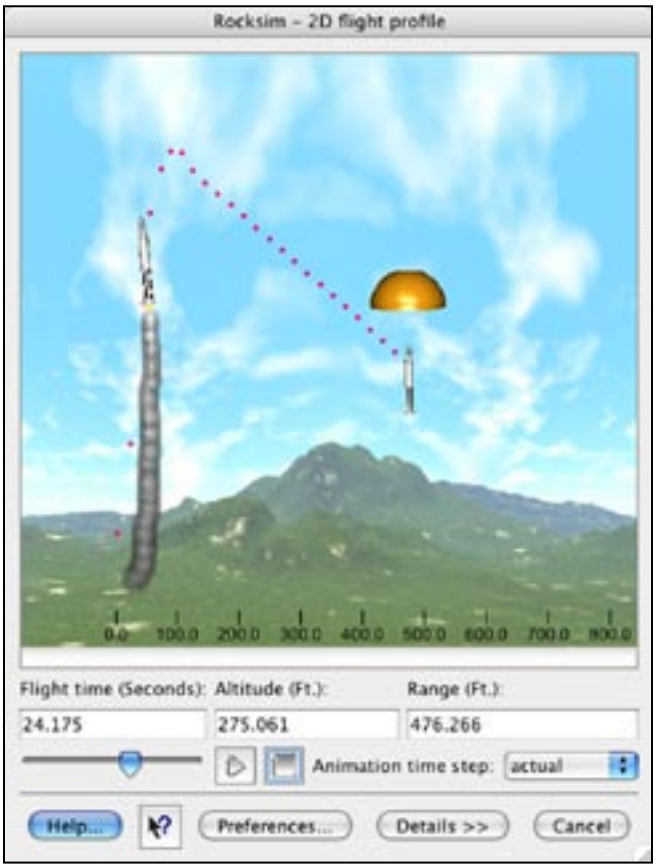


Figure 6: Composite image of the 2D Flight Profile screen showing liftoff and recovery.

I think that when it displays your unique rocket in the animation, you'll feel it was worth the effort. But let me know your experiences.

Version 8 Feature Reductions

There were several hard choices Paul Fossey (RockSim's programmer) and I had to make as we were working on RockSim v8's feature list.

A couple of those difficult choices had to do with making sure the new Macintosh version had identical features and worked the same as the Windows version. There aren't too many, but I feel obligated to let you know in advance.

First of all, Windows users will notice is that the graphs RockSim creates will look a bit different than they did previously. On top of this, that the neat feature of being able to zoom in on key areas of the graphs is gone.

Why? The previous graphs were created using a plotting-package created by a company called Pro-Essentials. We paid them for the right to plug their software subroutines into RockSim. That was faster and cheaper than trying to create special software code from scratch.

Unfortunately, Pro-Essentials does not have a version of their graphing software that is compatible with the Macintosh. So we had to swap it out for a graphing system created by a relatively new company that has versions that work on both Mac and Windows. Being newer, their graphing software is not as polished and as feature-packed as the older one we used in version 7.

However, this new plotting software is adequate and the graphs are nice and readable. We hope that as time goes by they will upgrade it to include those advanced features that we all liked.

Another hard choice we had to make is that RockSim 8 will not open design files that were created in versions prior to RockSim v6.

The reason is that prior to RockSim v6, the .rkt files were saved in a binary format that was proprietary to Microsoft. Without violating Microsoft's copyright on that binary format, there is no way for Macintosh users to open those files. So we made the decision to limit RockSim v8 to files that were created version 6 or newer.

There is a simple work-around. If you have old designs created that you created in version 5 or older, you'll need to open and save them in RockSim version 6 or version 7. At that point, RockSim v8 can open them.

Finally, the last significant decision we had to make with RockSim was to add piracy-protection. In the past, we relied on the honesty of users to keep RockSim out of the hands

Continued on Page 6

Hidden RockSim Features

Continued From Page 4

of people that didn't pay for it. Unfortunately, not everyone cooperated, and there are hundreds if not thousands of illegal copies of RockSim in the world.

The piracy-protection is needed to make sure that we can continue to add new features you want to future versions of RockSim. As I mentioned above, we have to pay other companies for the use of their subroutines included in RockSim. We can't pay them if we don't make sales.

To this end, I'd like to apologize in advance for the tiny bit of inconvenience this is going to entail. Once you get it installed with the correct password, you'll be all set.

On the positive side, having piracy-protection in place for RockSim will allow us to have a demo version that is fully functional. Everything will work in the demo, including saving and printing rocket designs.

While feature reductions are not typical when a new version of RockSim comes out, we hope that you'll agree that they are relatively minor. They are more than offset by the new things we've added, such as the awesome 2D flight profile. I'll tell you a few more of the neat things we've added to make RockSim even better in the next issue. In the mean time, you can play with the free demo/beta version and discover them yourself.

Conclusion

In this article, I told you about two of the new features that are different in RockSim v8, and how utilizes them. I tried to explain how the 2D flight profile works, so that you can understand why it takes a little bit longer to load than it did in previous versions of RockSim.

I hope that I have also given you a sense of how much effort went into this new version of RockSim. It is my goal that you'll come to realize that it is the best bargain in all of rocketry. Once you start using it, I have no doubt that you'll feel you've gotten your money's worth.

About The Author:

Tim Van Milligan (a.k.a. "Mr. Rocket") is a real rocket scientist who looks forward to helping out other rocketeers. Before he started writing articles and books about rocketry, he worked on the Delta II rocket that launched satellites into orbit around the earth. He has a B.S. in Aeronautical Engineering from Embry-Riddle Aeronautical University in Daytona Beach, Florida, and has worked toward a M.S. in Space Technology from the Florida Institute of Technology in Melbourne, Florida.

Currently, he is the owner of Apogee Components (http://www.apogeerockets.com) and the curator of the rocketry education web site: http://www.apogeerockets.com/education/. He is also the author of the books: *"Model Rocket Design and Construction," "69 Simple Science Fair Projects with Model Rockets: Aeronautics"* and publisher of the FREE e-zine newsletter about model rockets. You can subscribe to the e-zine at the Apogee Components web site, or sending an email to: ezine@apogeerockets.com with "SUBSCRIBE" as the subject line of the message.

ROCKSIM v8

Software For Those That Want To Take Control Of The Design Process

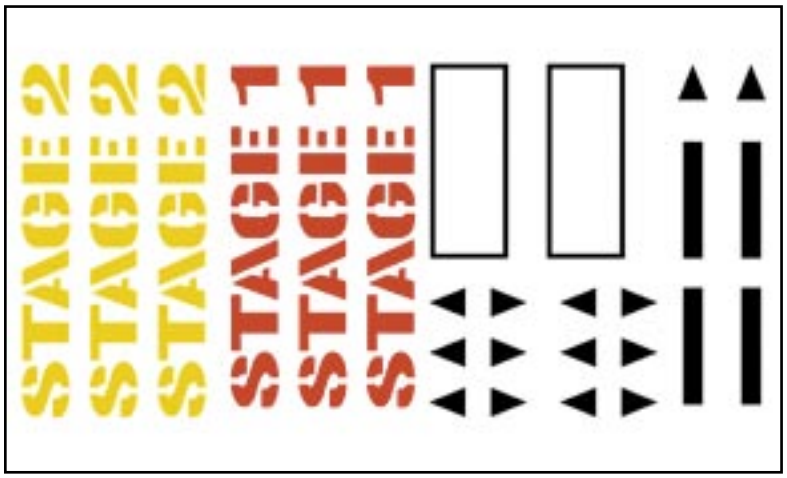
RockSim allows you to design any size rocket, and then simulate its flight to see how high and fast it will fly. You can also use it to find the best motor combinations for your existing kits, and to teach about the physics of flight. It prints out parts lists, drawings, and patterns, allowing you to quickly construct your designs. It has many CAD-like features: like 2D and 3D views, so you can see what your rocket will look like when you build it. Download the FREE trial version today. Visit:

www.ApogeeRockets.com/RockSim.asp

Apogee Components
tel: 719-535-9335

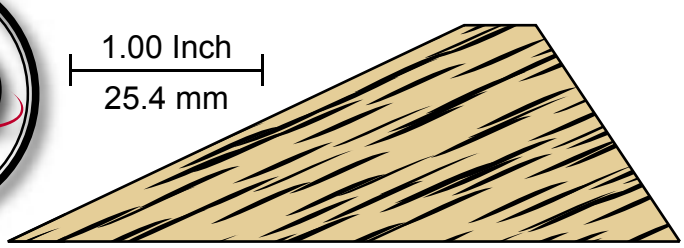
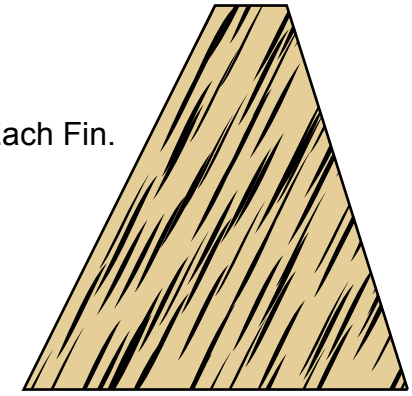
FREE PLAN: "TwoNer"

By: Shrox



Download the FREE RockSim Plans And Decal Artwork

The data file you need is at:
http://www.ApogeeRockets.com/shrox/twoner.html

Open the design file with the NEW RockSim version 8.0

Make 3 of Each Fin.