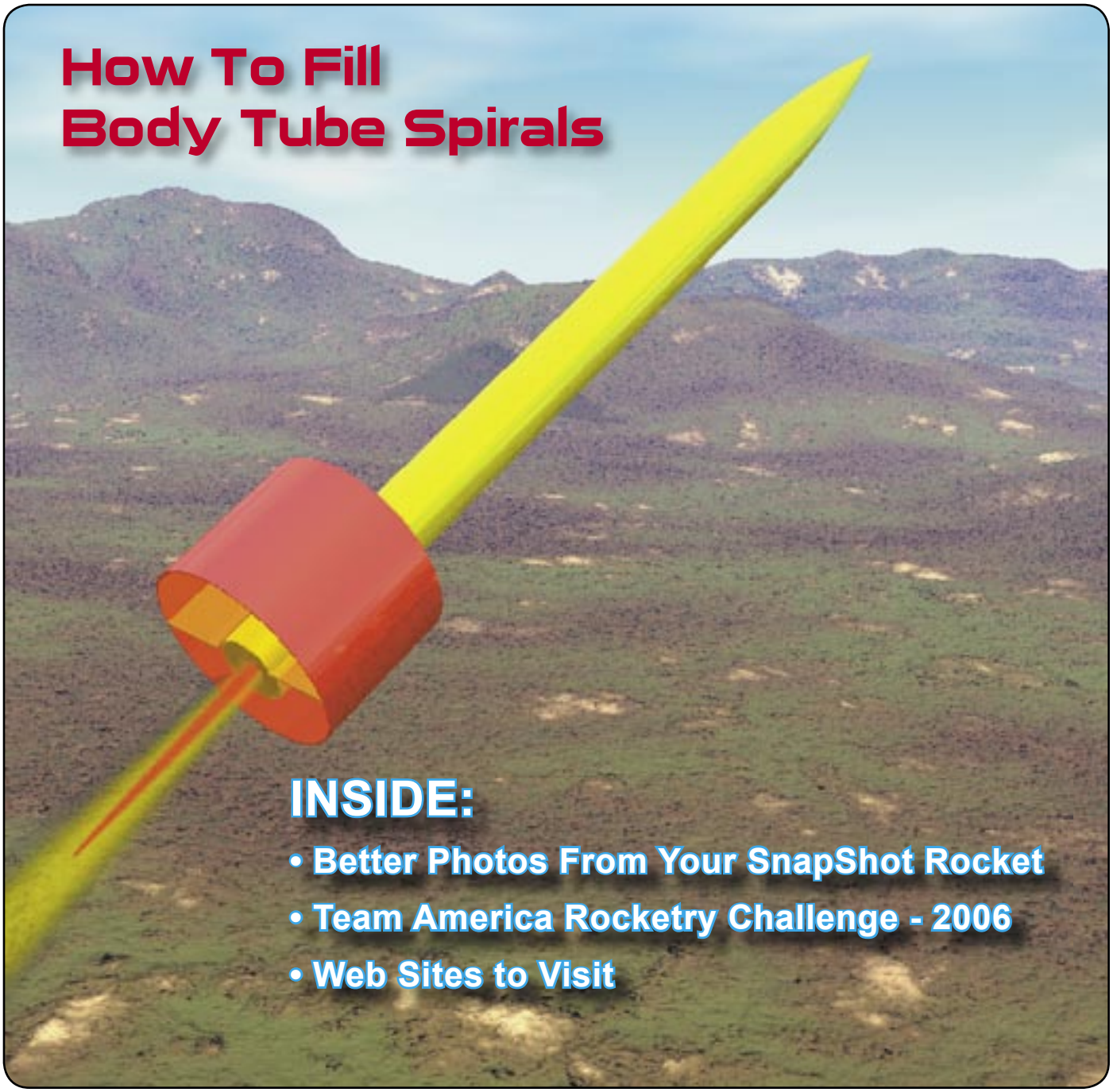
ISSUE 147 - AUGUST 22, 2005

# APOGEE PEAK OF FLIGHT NEWSLETTER



## How To Fill Body Tube Spirals

## INSIDE:

- Better Photos From Your SnapShot Rocket
- Team America Rocketry Challenge - 2006
- Web Sites to Visit

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# Filling the Void: Smoothing Out Body Tube Spirals

**by John Manfredo**

There is nothing like a smooth finish on a rocket. This final look depends upon how well you prepare the rocket beforehand for finishing. New modelers (and sometimes experienced modelers) often have the question *"How do I smooth out and get rid of those irritating spirals that come with most body tubes?"*. Many rocketeers complain about nasty spiral grooves in their airframe. Most phenolic and kraft-paper body tubes used in rocketry have a spiral groove from end to end. If this is not filled it can make nice paint jobs look ugly.

I learned this the hard way. They don't seem extremely noticeable during construction but really stand out during painting. Go to the local hardware store and get wood filler. Most people use Elmer's Wood Filler (or automotive spot filler that is used for door dings). The Elmer's brand is water-soluable, so you can thin it with water. Automotove spot-filler will require a different thinning agent, such as alcohol, or acetone.

A putty spreader or old credit card works well for spreading. Scoop some out and add a bit of thinner, stir and whip like crazy until the consistency is like creamy cake frosting.

**Figure 1 & 2: Thin the filler to the consistency of cake frosting.**

Buy a can of frosting at the supermarket to see what I'm talking about.

This Elmers' wood filler brand spreads like butter (or frosting for that matter) over cardboard, fiberglass, plywood, paper, and almost any surface. It sticks incredibly well and sands like a dream. It can be applied with a brush, a spatula, and fingers, almost anything. If it starts to harden up too soon and look clumpy, mist it lightly with water and smooth.

Fill 'n' Finish fills spirals in a heartbeat. When using on fiberglass make sure the part has been sanded with coarse grit sandpaper that allows the Elmer's to achieve a mechanical bond. The surface profile created by sanding is called "tooth" which means it provides little gaps, nooks and crannies for the material to "bite" into. Typically 80-grit would be used on fiberglass. The following are the steps you can take to get a nicely finished rocket.

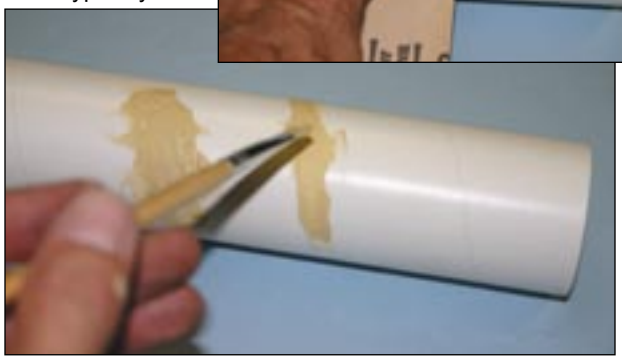

**Figure 3 & 4: Sand the tube lightly, and fill spirals with the filler.**

1. Rough up the body tube with sand paper to remove the shiny finish.

2. Take small amounts of filler, spread into the grooves with your putty knife and scrape the excess away with the spreader.

As an option, you can also choose to use a small paint-

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**Figure 5: Sand the tube to smooth out the filler. Add additional filler as necessary to pack really deep grooves.**

brush to spread and smooth it out. Simply get a small cup of water to dip the brush in and you can brush the filler to a fairly smooth consistency.

3. Once filled allow it to dry. With the Elmers's brand the drying time is about 2 hours. You can heat it with a hair-dryer if you want it to dry faster..

4. Sand the tube smooth once again using 100-grit sandpaper. Use a circular motion when sanding to avoid gouging the filled area.

5. Apply another layer of filler because some places might be lower, particularly for tubes that have deep grooves.

6. Allow to dry and sand this time with 150-grit sandpaper. This will take the filler down pretty quick.

7. If you rocket has through-the-wall fins, scrape any filler out of the slots with an exacto knife.

**Figure 6: After the grooves are filled, spray with a sandable spray primer paint.**

Now sand again with 180 to 320 grit sandpaper.

8. Your tube is now ready for finish. When painting, first put down a heavy coat of spray primer (the sandable kind). It will show you the blemishes on your rocket so you can fix them by a bit of more sanding. It usually takes two or three iterations of priming and then sanding to get that glass smooth finish.

It's best to fill the grooves before construction. By following these easy steps you can greatly increase the appearance of your rocket. You can see in Figure 7 how great it looks when you fill the spiral groves in your rocket!

**Figure 7: By filling the spiral grooves, your rocket will look better and fly higher.**

This technique of filling spirals is covered in the "Saturn V video instructions." You may wish to view them for other tips on filling spirals. You can find the video book at: http://www.ApogeeRockets.com/saturn_instructions.asp

Of course, there is a lot more to getting a great looking model than just filling the spirals. There is sanding the airfoils into the fins, sealing any wooden parts, and applying great looking fillets. If you want to learn how to do these steps correctly, I would recommend the entire 4-volume CD-ROM collection of video-books. It is well worth the investment, because you'll end up with models that will really turn heads at the next launch you go to. You can find the video books at: http://www.apogeerockets.com/video_book_collection.asp

## 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. *(ed. You can't be that old, John...)*

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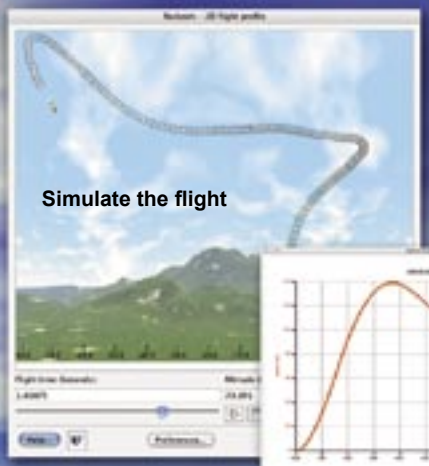
Simulate the flight

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### WHO USES ROCKSIM?

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- Aerospace engineers.
- Rocket enthusiasts all over the world.

### IS IT EASY TO USE?

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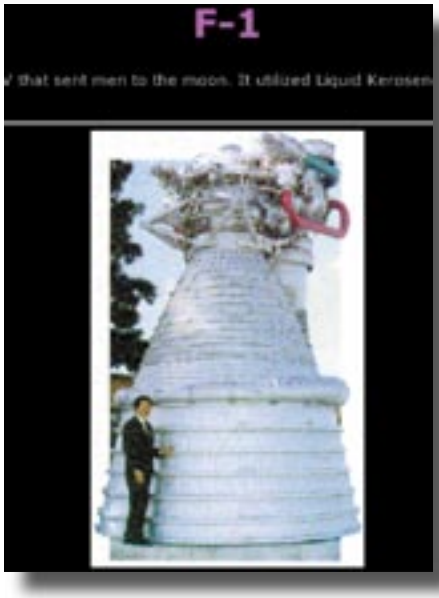
# WEB SITES WORTH VISITING

Our latest website pick is Aerospaceguide.net and can be found at http://www.aerospaceguide.net/. This site has a variety of space-type information.

To start off, there are many links to information about the solar system and in-depth individual planetary details, which is a great educational feature for students. Here, you can learn that the diameter of Mars is 1444 miles, the surface composition is nitrogen, carbon monoxide, methane and water ices, and also that the average surface temperature is -382ºF.

They have pages dedicated to space exploration, spacecraft and a multitude of links to space news sites. There are many pages that detail the different types of rocket engines from around the world. Little known facts are found here such as "In June 2002, Boeing Company was creating a design for a new reusable rocket engine (RS-84) that would generate more than one million pounds of thrust (at sea level) and could be the first-ever multi-mission booster to use oxygen-rich gases in combination with kerosene fuel. It is being designed for NASA's Space Launch Initiative (SLI)".




Also included on this website are a number of space related books that are available for purchase. Such titles include *Rocketman: Astronaut Pete Conrad's Incredible Ride to the Moon and Beyond*, *Deep Space: The NASA Mission Reports*, and *Virtual LM: A Pictorial Essay of the Engineering and Construction of the Apollo Lunar Module*. So many features are included in this site that I can't even tell you about half of them in this short article, but look for yourself and you'll find a lot to peruse through, find enjoyment from, and gain knowledge from.

If you have a web site that is worth visiting, please let us know. We'd love to take a look too. Please email the information to: johnm@ApogeeRockets.com

## Team America Rocketry Challenge

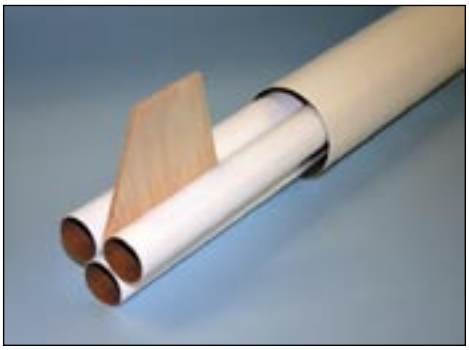
TARC-2006 looks to be more challenging than ever, which means it will be raining eggs soon. Get out your Kevlar® umbrella. All kidding aside, this is a great event.

This year, Apogee Components is going to reward the clubs that help make this contest such a success. It is my goal to build up the local NAR clubs, by infusing them with new members, extra enthusiasm, and maybe a little cash. Why do this? It is my belief that when the local flying clubs are strong, it makes the hobby more fun, larger, stronger, and better able to fight of government bureaucracy. Even if you are not a member of a local club, this will benefit you too because it benefits the whole hobby of model rocketry.

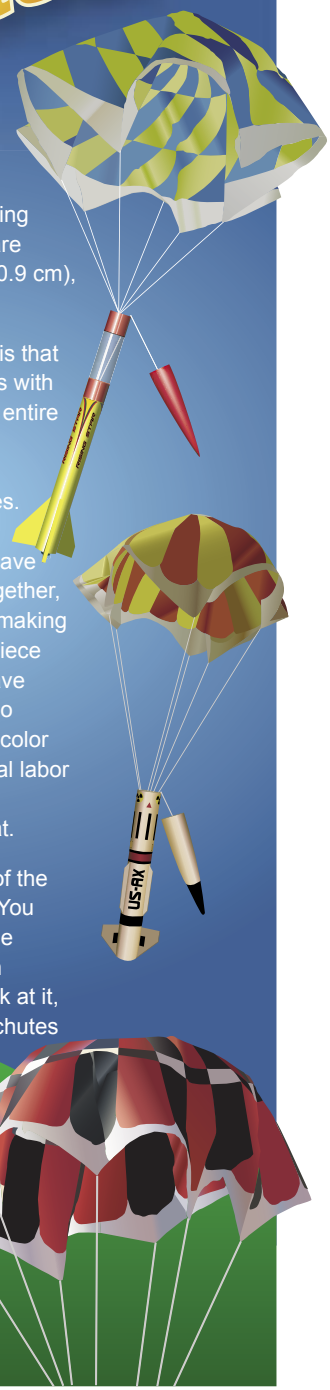
I'm putting the finishing touches on the new program, but I think your club will find it a big boost when I announce it. In fact, I think you'll wonder why no one has done this before. It is simple idea that supports your club for what it is already doing. So watch this e-zine newsletter for the big plan. - *Tim Van Milligan*

## DEFINING MOMENTS

"Wedging" is a fin attachment method for models with a cluster of two or more tubes, where the fins are glued into the gaps between the tubes. This increases the strength of the joint.



## DynaStar Rip-Stop Nylon Parachutes!



DynaStar Mid-Power Model Rockets is offering a new line of rip-stop nylon parachutes with colorful and eye-catching patterns printed on them. The chutes are available in three popular sizes: 24" (60.9 cm), 36" (91.4 cm), and 58" (147.3 cm).

What makes these parachutes unique is that they are the first nylon cloth parachutes with colorful patterns printed directly on the entire parachute. They combine the strength and durability of fabric chutes with the eye-appeal of printed plastic parachutes. Previously, the only way to get a multi-colored nylon parachute was to have different colored fabric pieces sewn together, involving extra labor and material and making them much more costly than a single piece nylon chute. These new parachutes have the color pattern printed on the fabric so the additional labor for sewing a multi-color parachute is unnecessary. No additional labor means that these parachutes are very affordable as well as stunning to look at.

"The ink actually soaks into the fibers of the cloth, making it colorful on both sides. You can't tell which is the inside or which the outside," said company owner Tim Van Milligan. "No matter which way you look at it, from the top or the bottom, these parachutes attract attention when you fly them."

For more information on these new parachutes and to see a list of dealers that carry the DynaStar Mid-Power Model Rockets, visit:

**http://www.dynastar-rockets.com/Parachutes.html**

# TIP OF THE FIN

This issue's tip of the fin has to do with the Estes Snapshot (formerly Astrocam) camera rocket. You may wonder how to get better photos back from the camera. That's what this week's tip is about.

The Snapshot is a simple camera. There isn't any way to make adjustments to the camera itself. Everything is fixed and ready to go. But there are things you can do to get different perspectives from your shots. Most notably is the engine delay used in the rocket. You can choose short, medium or long ejection delays, and this choice will change the composition of the photograph.

The first shot was taken with a C6-7 from about 650 feet above ground level while on its decent after apogee. The rocket was moving about 34 mph (calculated by the RockSim software) at the time the picture was taken. This gives you a photo that focuses in on a more concentrated area just below the rocket that, in this case, are the two houses, their surrounding property that you see, as well as a road.

The second shot was taken with a C6-5 from about 725 feet above the ground just after apogee. This time the rocket was moving at about 7 mph. You can see what a slightly shorter delay will do for your pictures. The rocket is in more of a horizontal trajectory, thus producing a picture of the horizon and the area with houses off in the distance. Notice the shadows on the ground to the right of every building.

You can use the shadows on the ground to indicate orientation of objects in the photos. In this case, the shadows tells us that the picture was taken while pointed in a southwest direction.

According to Rocksim's accurate predictions, if we were to fire the rocket off on a C6-3, the rocket would be still in a vertical trajectory at 640 feet above the ground when the picture would be taken. It would be moving at approximately 52 mph at that point. This could cause the picture to blur and, depending on the day, you might get a very "blue" picture. On the other hand, if you had an overcast day with the right conditions you may get a nice picture of a cloud formation!

Using ASA 400 speed film also seems to help in obtaining clear photographs, but be aware, the higher the speed, the more graininess you'll get in the photo, and the darker it will be - use this film only on a bright sunny day.

To purchase one of these fun camera rockets, please visit our website at http://www.apogeerockets.com/estes_snapshot.asp.