Apogee Components

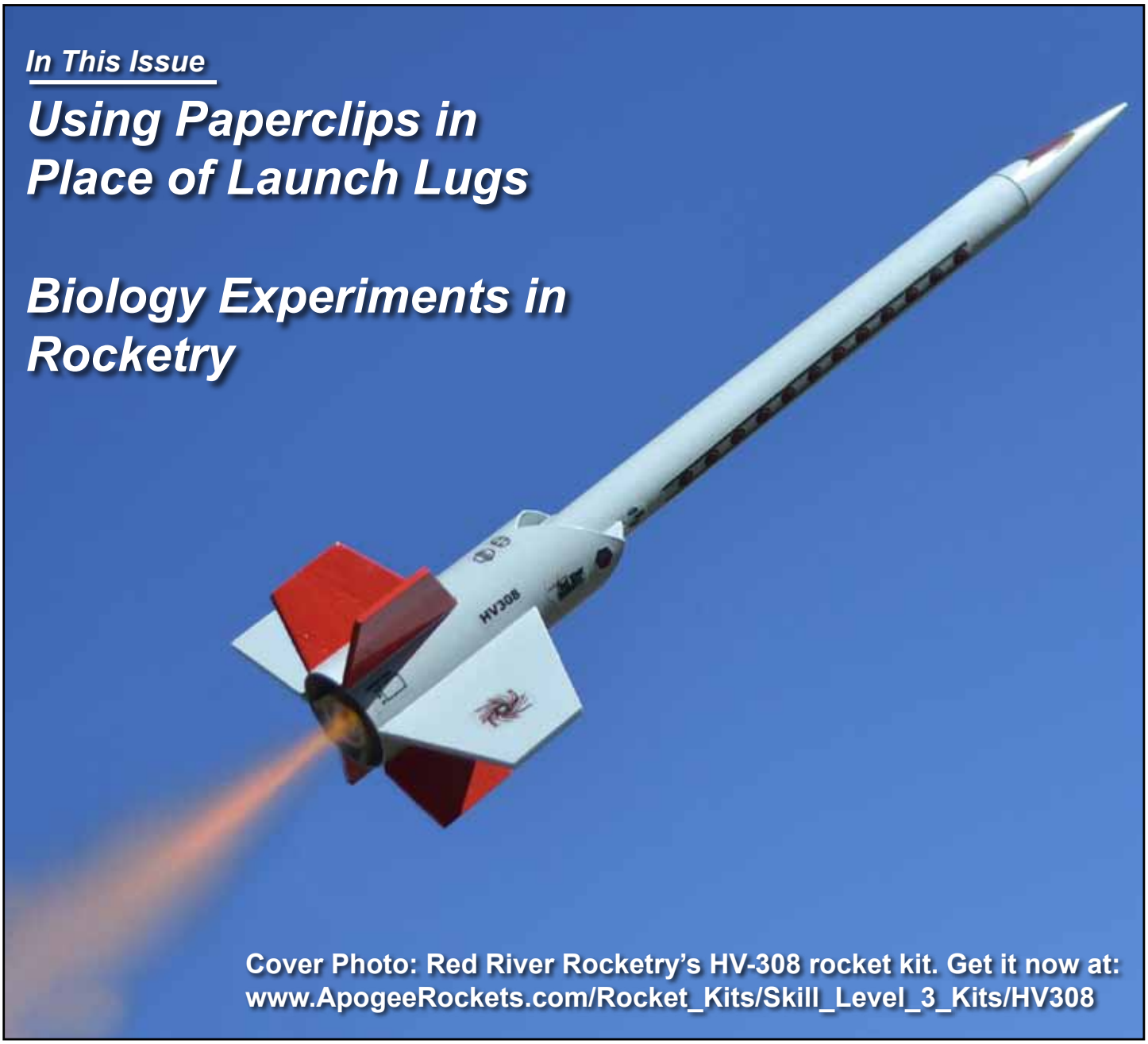
PEAK OF FLIGHT

NEWSLETTER

In This Issue

Using Paperclips in Place of Launch Lugs

Biology Experiments in Rocketry



Cover Photo: Red River Rocketry's HV-308 rocket kit. Get it now at: www.ApogeeRockets.com/Rocket_Kits/Skill_Level_3_Kits/HV308

Apogee Components, Inc. — Your Source For Rocket Supplies That Will Take You To The "Peak-of-Flight"
3355 Fillmore Ridge Heights
Colorado Springs, Colorado 80907-9024 USA
www.ApogeeRockets.com e-mail: orders@apogeerockets.com
Phone: 719-535-9335 Fax: 719-534-9050

ISSUE 350 OCTOBER 22, 2013

Using Paperclips in Place of Launch Lugs

By Joseph Peklicz

Do unsightly launch lugs ruin the appearance of a beautifully built scale rocket? Here's a way to rid your model of launch lugs when it is put on display, and then to add them back before flying it.

Photo 1: The tools needed to make the paperclip lugs.

Photo 1 shows the materials needed to make the clips.

- Box of paper clips
- Short length of wood dowel rods, 1/8" and 3/16"
- Pair of pliers with cutter built in
- Pencil (not shown)
- Super glue (optional)
- Safety pin (not shown)

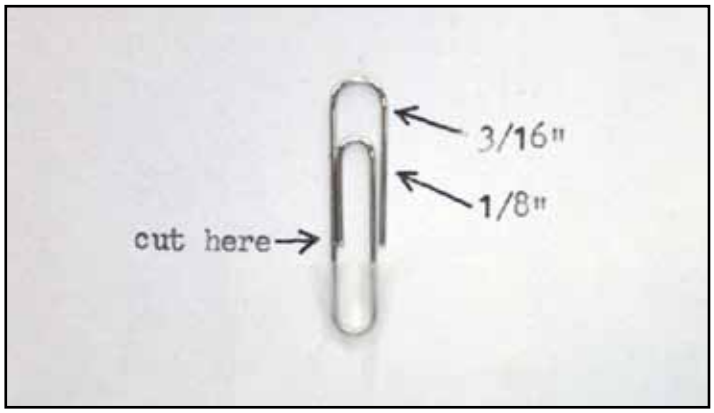


Photo 2: The standard paperclip.

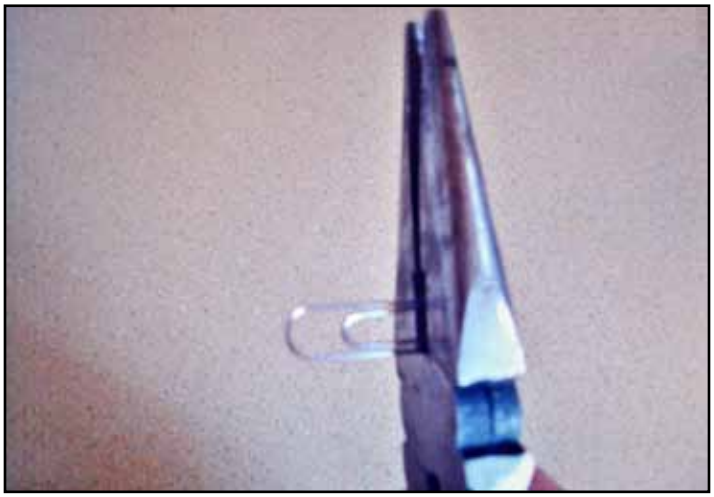


Photo 3: Cut the paperclip to have long legs.

Photo 2 shows that these are the standard size paperclips. With only two clips, you can make "launch lugs" for two rockets. One for a 3/16" rod and one for an 1/8" rod.

Photo 3 shows where to cut the paperclips. Do this for each paperclip.

Photo 4 shows an example for a 3/16" clip. Use a 3/16" dowel rod through the clip. Set the pliers so you have at

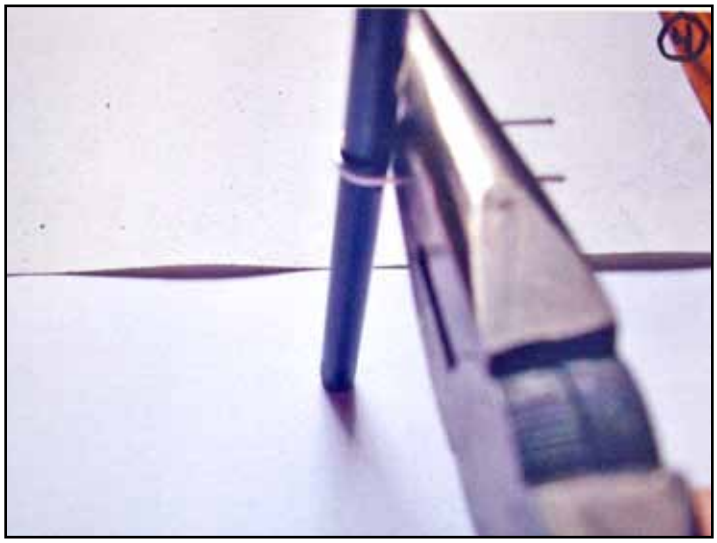


Photo 4: Grasp the legs of the clip with pliers so that they can be bent upwards.

Continued on page 3

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

Writer: Tim Van Milligan
Layout / Cover Artist: Tim Van Milligan
Proofreader: Michelle Mason

Continued from page 2

Using Paperclips in Place of Launch Lugs

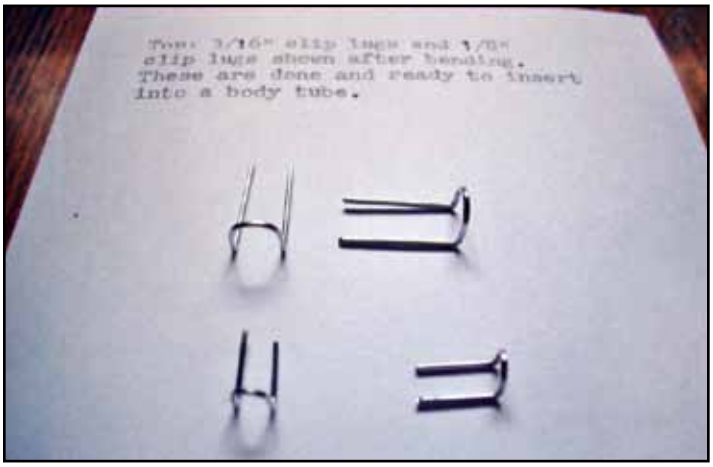


Photo 5: The paperclips after bending. These are done and ready to insert into a body tube.

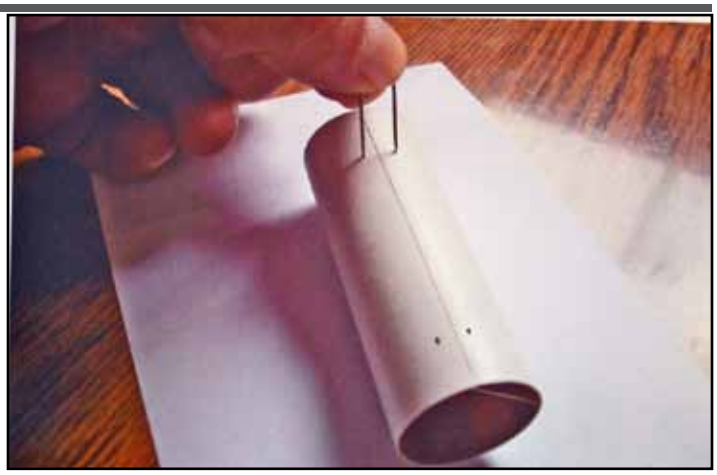


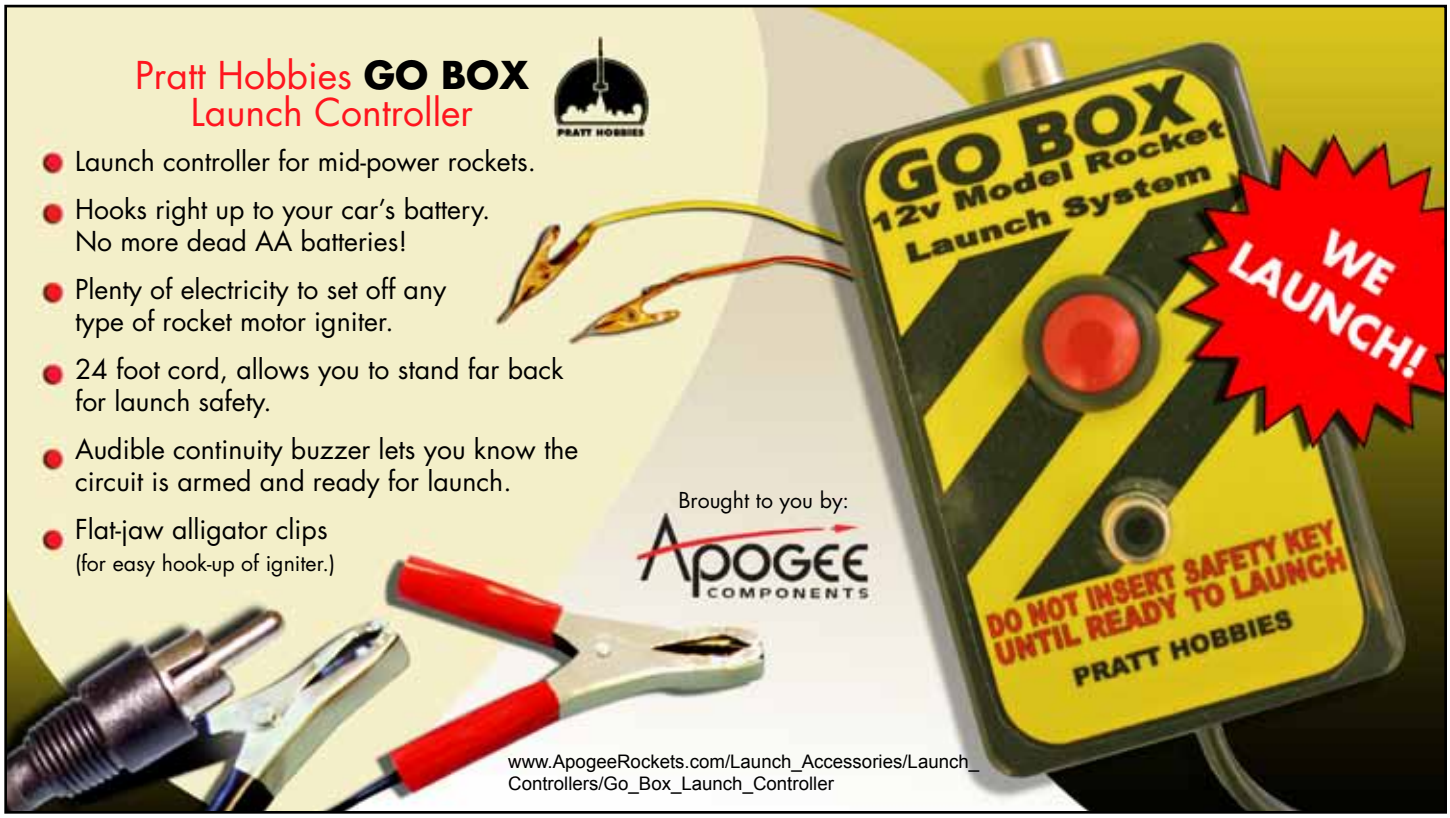
Photo 6: Poke through the tube will a safety pin for the paperclip launch lugs.

least the thickness of the clip for play. In other words, don't place the pliers snug against the dowel rod. Leave some room, about 1/16" of play. When you go to bend it, the slack will be taken up.

Photo 5 shows that two paperclips yield two different sizes. Kill two birds with one stone! They are bent up 80 degrees. If you can't bend them with your thumb, lay it up against a table, brick, or any solid surface. Push the pliers down until it's bent.

Photo 6 shows a scrap of body tube *(you didn't expect me to build a new rocket, did you?!)*. Draw a straight line up your body tube. Mark off where your clips will go, usually in the same space where a regular launch lug will go. Leave a little over 2" between them. Place the bent clip centered over the line. Mark with a pencil the points on the tube where the legs of the paperclips will pierce through the tube; two marks for the top and two marks for the bottom

Continued on page 4



Continued from page 3

Using Paperclips in Place of Launch Lugs

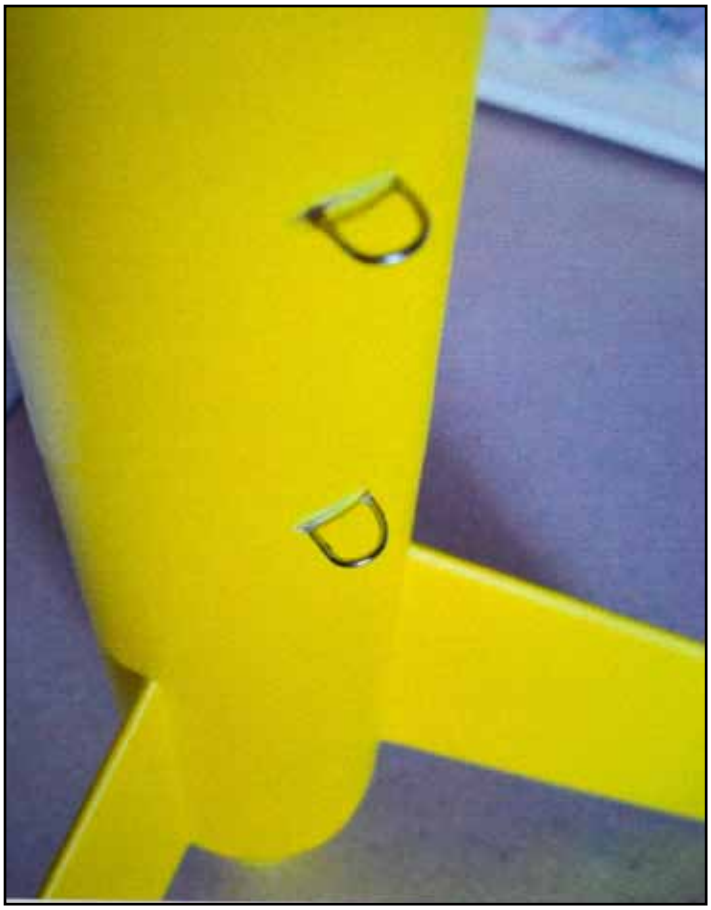


Photo 7: The paperclip lugs installed on a rocket.

clip.

Use a safety pin to punch through the pencil marks. This will make it easier to insert the clips. You may now use super glue to place them permanently from the inside of the tube. Or, if you want them to be removable, don't use the glue.

Photo 7 shows the clips in place.

Photo 8: From a few feet away, they are barely visible.

Photo 8 shows a scratch built sport model utilizing the "Clips". From a few feet away, they are hardly noticeable!

Note: no research has been done to see if these "Clips" are any more aerodynamic than regular launch lugs. Maybe a good experiment for NARAM!

Biology Experiments in Rocketry

By Ben Gottsch

"Biology and rocketry"; not exactly something you think would go well together, especially in the hands of modelers and amateurs. But something all of us could do is building rockets that instead of bring the living things up into the air, bring the bacteria and microbes down to the surface.

With smaller model rockets, this is pretty easy, and in fact is something good for school activities and science fair projects. But I want to do some real science, and get some of the bigger rockets involved. This is much harder to do, because they go faster, get up to speed faster, stay in the air longer, go higher, and don't have as good of a chance for success. But that is the great fun in rocketry, when you try you find out what went wrong and try again. So for this "experiment" as we'll call it, we need to find a good base to build off of. So I will start with lower power rockets, with engines like C's, B's and A's. Then I will transfer over into the higher power rockets with motors of power H and up.

For smaller rockets, it really is quite simple. All you need is a small model rocket with a payload section, built from scratch or you can get a model. I am assuming that you are an experienced rocketeer who is looking for something new to try out. You will need to build your rocket. The one I built is powered by a C, only because I really want to see what is up there, but your can use any type you want. You can even have a second stage if you so wish.

Making the Collector

In the area where there is a payload section, you need to build a system for collecting the bacteria. This is where things can get tricky. What you need is a test tube that is closed during the launch, yet at apogee is opened to collect your specimens. This is a tricky thing to accomplish. Some people would have timed electronics that open and close the chamber at apogee, but that is heavy and hard to do, especially with smaller rockets.

A system that works really well is with marbles and springs. A marble rests on the top of the test tube, with a spring on top of it. During launch, the marble seals the test tube, and keeps as many ground specimens out as possible. When the ejection charge is fired, the sudden slow down causes the spring to compress for about a second, collecting enough air and specimens for the experiment, and then it seals the tube up for the trip down. Then you can collect it, and go into phase two.

After collecting your specimens, you will want to get

Continued on page 6

Continued from page 5

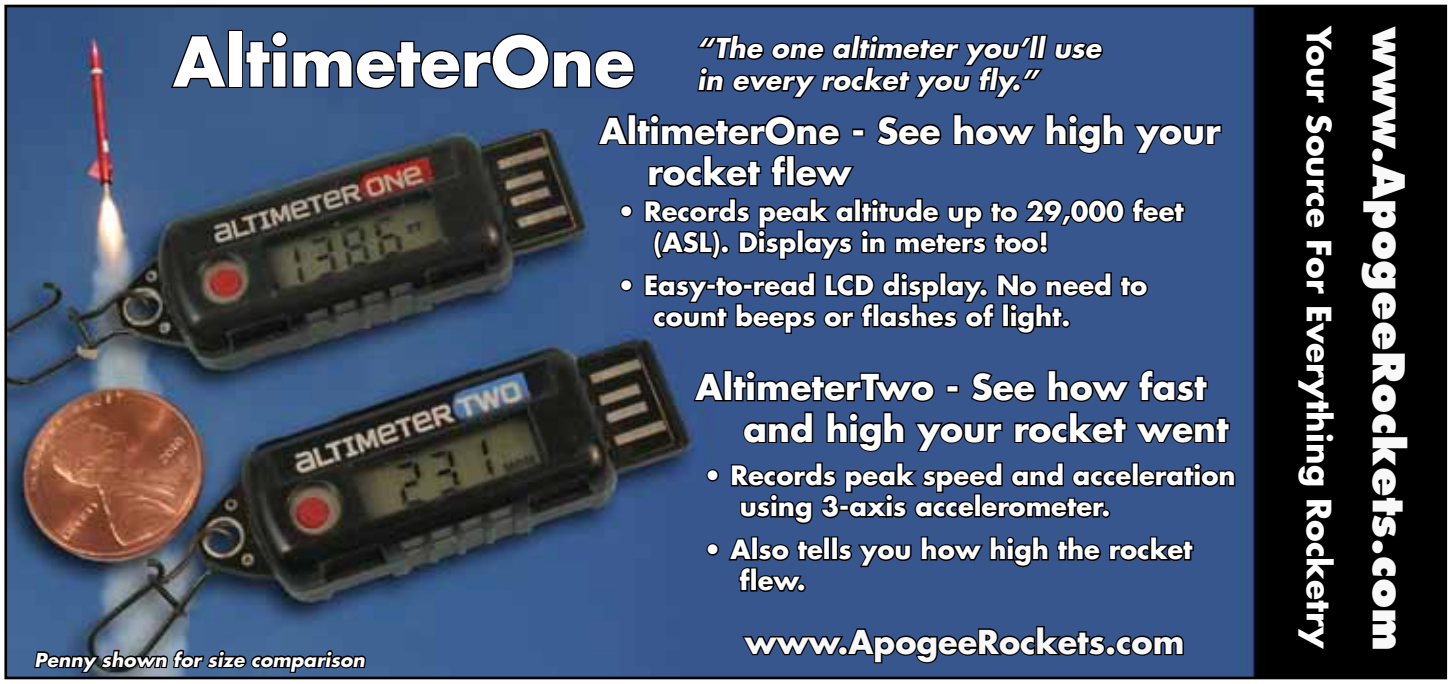
Biology Experiments In Rocketry

them incubated, so you get an idea on what bacteria are at that altitude. What you can do is two things. One, you can go to a college or university, and see if they can incubate it for you (I recommend this because the equipment to do this is expensive). Or, if you have a good pool of cash, you can go and buy an incubator and a petri dish, and try this yourself.

What will happen is larger colonies of bacteria will grow, and form blobs on the dish. It will be visible and can be categorized by the different colors, shapes, and overall looks of the colonies. You can then seal up the dish, write what colonies formed, and depending on the type of experiment you are doing, try it again.

Now for a real challenge: high powered rockets. They go faster and higher than smaller low powered rockets. You can try the marble system, but because we are getting into larger diameter rockets, we can now try and do an electric or a new type of method for collecting. With the electric, you will want either a servo to plant a cork in place, or a piston to push it down during descent and ascent, and to lift the cork at apogee. I recommend this method, as it is easier.

Another way you could do it is with weights that slide up and down, in order to seal the tube. This is hard to accomplish and I have never done it very successfully. Now that you have your payload section, you will want to have it atop a rocket that you know will be able to carry it, and has had great success rates. Choose carefully. This does not have to look cool at all. This is one of those that must work in order to get the full effect of it. If you want to build it from scratch, then build one of the simplest rockets that can still be able to handle the stress of launch and landing. When you are done launch it, and collect your specimens. Do as you did with the lower powered rocket, and then record your data.

Experiments that you can do with these methods are to see what species of bacteria are at lower altitudes, and compare them to higher altitudes. See what species are at a certain altitude, during which time of the day, week, month, or year. You only need to understand that if you want to do some real science, you need to have multiple tests, and have an idea of what you want to find out. Go crazy.

You don't have to follow my examples. Test what you want. That is the fun part. The most exciting part is when you have your data, and you get to share it with the world. Show us what you found, give your research a snappy name, show the launches, the system used, and the data you found. Tell us what you learned. This won't get you a nobel prize, but this is something fun to do, and is a great way to show off your ingenuity, and interest for science. I know I have a ton of fun with this, and hope you guys do too.