Apogee Components

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NEWSLETTER

Want To Start Your Own Rocket Company?

Ten Types Of Products That Will Give You An Edge On Success

Reader Questions and Suggestions

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What Products Are Needed In The Rocket Industry

By Tim Van Milligan

As I write this, there is a report out that says the US economy has shrunk at an annual rate of 6.1 percent based on the results for the first quarter of 2009 (www.bloomberg.com/apps/news?pid=20601087&sid=ahqiXwGIg3KQ&refer=home). That's unnerving news. That means that companies are cutting back and many of them are laying people off. I personally know too many good friends that are unemployed. I know that some of those friends are considering starting their own businesses so that they can take control of their futures. I believe that is a great idea for them.

I'm sure that your own personal situation is better. But if you are thinking of starting a small business, right now is actually an excellent time to begin. If any business can survive right now in during this downturn, it will be poised to do really well in the future once the American consumer gets their confidence back.

If you're thinking the model rocket business would be fun to get into, I have to say that you are right. I love being in the model rocket industry, and I look forward to getting up and going in to the office. My favorite day of the week is Monday!

In this article, I thought I'd share with you some of the opportunities and the pitfalls that you may need to know about if you want to get into this industry. If you're going to take the plunge and start your own business, you should at least know what you're getting into. Let's start with what I think are the biggest opportunities.

Product Opportunities

If you're going to be in business, you'll need some products to sell. But before I give you those ideas, I'll tell you right up front what is hard to sell. That is... drum roll please... "rocket kits."

Right now, there is a glut of rocket kits on the market. Estes is the major manufacturer of kits, and they probably have around 60 models in production at any one time. Quest is next up with a little more than half that number. Add in Apogee Components, Sky Rocketry, DynaStar Mid-Power Model Rockets, Semroc, Flis Kits, Dr. Zooch, Quasar One, Sunward Aerospace, Red River Rocketry, Q-Modeling, Mad Cow Rocketry, Aerotech, Cosmodrome, Always Ready Rocketry, LOC, Public Missiles, ASP, and about 30 other garage-shop manufacturers, and there are probably over 400 different rocket kits that are on the market right now. Is that really true? Well, we don't even carry a fraction of the different manufacturers, and if you check out the Apoge Components web site vendor page (http://www.apogeerockets.com/rocket_vendors.asp), you'll see that we carry over 150 different rockets in our store. Any one particular kit doesn't sell hundreds of units, which means that if you make just one kit, your new rocket company won't be around very long.

Selling those kits (as a dealer) is also tough too. There is always someone that is able to undercut you on prices and steal your business away.

I don't want to dampen your spirits, but basically manufacturing and/or selling rocket kits is a tough business to be in, even during good times because there are so many competitors.

But there is some good news. There are other products where the number of competitors is fewer or even non-existent. That means you could get into those market segments and have a better chance of succeeding.

Below is the list of products that I wish I could be selling right now. I know what you're thinking: "Tim, are you crazy? Why are you giving away your wish list? It will give your competitors a chance to put you out of business." That thought is going through my mind too. And I'll address it later after I disclose my wish list.

1. Electronic Payloads

When people think of electronics, the first thing that pops into their mind is an altimeter. That is what I'd think of too. Right now there are about five or six manufacturers that are making altimeters, so there is some competition. But compare that to 30 or 40 rocket "kit" manufacturers.

Now I really wouldn't suggest you start a business where there is even that many manufacturers. But if you want an edge if you decided to break into that market, then you'd have to go after the low-price customers. There are a lot of high priced altimeters on the market right now. If you

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could get a no-frills unit below $30 retail cost, then you'd have the holy grail of altimeters. Is this possible? I don't know. I know that the sensors are expensive, but the prices are gradually coming down.

But there is so much more than altimeters when it comes to electronic payloads. There are other things like radio trackers, GPS trackers and flight computers where there are only two or three manufacturers right now.

Where there is NO competition right now is "scientific payloads." No one is making gizmos where you can actually do scientific research. For ideas on what one could make as a payload, all you need to do is look at what is being researched by NASA and many universities. The NASA sponsored Student Launch Initiative is a great place to get ideas for products.

Would these scientific payloads sell? I believe they would. There is a small, but growing market in the education field that desires such products. Teachers would teach rockets more if they had something that just went up and came down. If there was some real science in the flight, besides just studying the physics of the flight, they'd be ecstatic.

The payloads don't have to be electronic. They could be biological too. The field is so wide open for a new manufacturer, that I'd give their chances of success to be much higher than the national average for new businesses. If you want more ideas, see the book "Model Rocket Design and Construction" (www. ApogeeRockets.com/Design_book.asp).

To sum things up: payloads for rockets is a great market to be in because there isn't much competition!

2. Rocket Photography

About five years ago, I was begging someone to come up with a nice 35mm camera for rockets. At that time, the only still-image camera on the market was the Estes Astrocam. With it's tiny 110 film size, the images were pretty grainy. A 35mm film would have been a giant leap forward.

But as of today, I don't want a 35mm camera anymore. Everything is "digital!" I predict that in 5 years, you'll hear that film makers are going to stop producing film completely. It is already getting harder to find shops that still develop film. Like I said, everything is digital.

What is the market like for digital rocketry cameras? Answer: wide open!

Estes is the only current manufacturer making a digital

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camera for the rocket consumer. Their first camera was the Oracle, which had a decent little video camera in it. But it was heavy and required D-size rocket motors to launch it. That didn't really bother me, as our customers here at Apogee Components are not opposed to bigger motors. But Estes' bread-and-butter market is in the smaller A, B, and C-size motors.

So next they came out with the Astrovision rocket that could use the C-size motors. That was an excellent idea, as it would open the market up to a lot more customers. In fact, there was a huge amount of excitement about the new camera rocket when it was first announced. People definitely wanted it.

But in my humble opinion, it could have been executed better. The first glitch was that they bundled the rocket with a launch pad. I understand why they might want to do that; they have an easier time selling starter sets, and this would position the product in that category.

But for you and me, who have been in rocketry for a while and already have our own equipment, why should I have to pay extra to get another launch pad? It only drives up the cost unnecessarily for the hard-core rocketeer. Without the pad, they could have cut the price by fifteen bucks, and it would have put the rocket at a real attractive price point.

The other glitch, in my opinion, is the camera isn't the greatest. In fact, it has a lower resolution and frame rate than the original Oracle rocket. That makes the images grainy, and the video very jumpy. I think a lot of people were expecting a better camera in the newer rocket, and they were a bit let down even though the price of the Astrovision is lower than the Oracle.

Finally, the software to download the video from the camera isn't very user friendly. I suppose Estes inherited the software from whatever manufacturer made the camera itself. But this is a significant flaw in my opinion.

First of all, the software doesn't run on a Mac. Who cares? I do. I use a Mac, and so do a lot of our customers. Second, and even worse is that it doesn't run on Windows Vista. The camera came out about the same time that the Windows Vista operating system came out, and therefore it was obsolete on the day it was released. Additionally, there have been no upgrades to the software since it was released, and that only confounds the problem.

Figure 1: A Grave Danger rocket kit modified to carry a video camera.

I personally like the Astrovision for what it is. It is the only thing available, and it is a nice introduction into aerial photography. And that is why I do sell it at the Apogee Components web site. But like I mentioned, I think it could be lower priced if they didn't bundle the launch pad with it. If you would like more information

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about the rocket, check our out web site at: www.apogeerockets.com/Estes_Astrovision_Video_Rocket.asp

We got word recently from our supplier that Estes is supposed to discontinue the rocket soon. I don't know if this rumor is true, but we're on a rampage to scoop up the few remaining Astrovisions that they have in their inventory. I hope this means that Estes may come out with a better version. But if they don't, that means for budding rocket-camera manufacturers that the field is wide open to opportunities.

It really does excite me about the newest digital video cameras. You can get a cheap High Definition video camera today for $130. Read that again: HIGH DEFINITION! All someone needs to do is take that camera, scrap the plastic casing from it to reduce weight and mount it in a payload kit, and they have an awesome product. Here is a link to an example video of what we can expect for the future of digital video footage from a rocket: http://www.cosrocs.org/sli/onboardfinal.mov

Here's another opportunity for some budding entrepreneur. Why limit the camera to the standard 30 frames-a-second rate? If the camera recorded at a higher speed, you'd get a better image back, and it would be a slow-motion flight that so many people want to see. Rockets take off so fast that the video is often jumpy, so a higher frame rate would also smooth out the image for the people watching the video

The particular camera mentioned above has two video modes: the high-definition, and 60 frames a second. I'd love to see a high-definition camera with the ability to record at an even higher frame rate for those ultra slow-motion playbacks. Hint, hint (that means I think it is a major money-making opportunity for someone).

3. Software

You'd think that the company that sells RockSim wouldn't want other software, right? Wrong. I'd love other software that compliments RockSim and does some things that it doesn't currently do.

For example, we'd love software that would take a RockSim design and allow the user to make custom print-outs of the design. I'd also like an add-on program that took the RockSim design file and did a structural analysis on the rocket. That way you'd be able to figure out if the rocket was strong enough for those big high-thrust motors.

The software market for this kind of product is wide open! There is no competition, which means your new product could be an instant success.

4. Launch Equipment

Don't think launch controllers. There are a lot of good launch controllers on the market right now from companies like Estes, Quest, Sky, Aerotech, Pratt Hobbies and a few others. I get people with new controllers that come to me all the time. Most of their designs are of the wireless variety.

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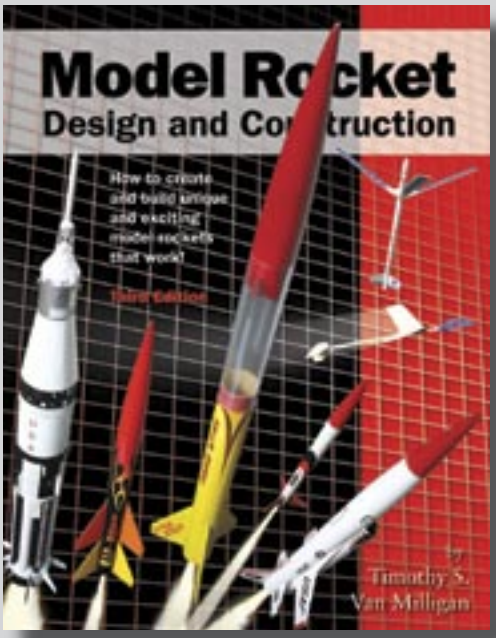

Model Rocket Design and Construction

By Timothy S. Van Milligan

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While that is cool, I haven't had any customers tell me they were interested in buying a wireless launch controller. The big issue is price. They can get a good reliable controller (that has wires) for a decent price. So unless the wireless controller was significantly cheaper, I don't see a big need for it, and neither do most customers.

The one exception on launch controllers is a multi-pad controller that schools and large groups might use. Unfortunately, while that market does exist, it is relatively small and you wouldn't sell that many controllers per year.

What is needed in the launch equipment field is more choices of high power launch pads that use rails instead of rods. Specifically, it has to be reasonably priced. I've been trying to get someone to make me one for a long time, but the cost of making the pad always seems to be the obstacle that can't be overcome. I just have a gut feeling that someone can come up with a high power pad that is designed right and can be produced for a really good price. If you could come up with that, you'd have at least one customer: me.

5. Range Boxes

There is no one selling good range boxes right now. I have a hard time believing that, but it is true.

I suppose if there were more woman in rocketry, there would be more options for keeping all your stuff organized. I know that this isn't politically correct to say, but woman seem to organize stuff better than men (at least me). My current range box is a big fishing tackle box, and it isn't optimized for rocketry stuff. It really needs to be twice as large as it is, with a fold-out table for laying stuff and not having it blow onto the ground. In fishing tackle, everything is small. But in rocketry, things are getting bigger and the slots in the tackle boxes are a bit too tight.

6. Igniters for High Power Motors

There are legal obstacles in making and selling igniters, but there are not a lot of choices right now. At least, that's my opinion. As with most of these items, the big issue to overcome is the price of the igniter.

7. Fiberglass Nose Cones and Fin Cans

Everyone wants parts made from fiberglass. From a sheer strength perspective, it is hard to beat. Rockets made from fiberglass can take an incredible pounding. And for altitude attempt rockets, it is definitely the way to go.

It is, in my opinion, one of the fastest growing segments of the rocket industry. And right now it only has two or

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three manufacturers. There is room for more manufacturers, even if it is to give some variety in the shapes of nose cones and fin cans.

8. Scale model rockets: 1/70th scale

While I don't think making rocket kits is going to be highly successful, there is a lot of demand from customers for scale rockets to go with the Apogee Saturn V and the Saturn 1B. The key to success in this market is that they all have to be the same scale, and it is 1/70th.

9. Large-Size Helicopter Recovery Models

This is the other exception for model rocket kits. People do like helicopter rockets because they are so unique. A BIG one, one that could use E or F size engines is the thing that is missing from the hobby. The problem is that helicopter models aren't very durable and break more easily than other types of rockets. And the bigger they are, the weaker they are. So if you could come up with a design that is big and durable, then you have a grand slam product. Then come talk to me first!

10. Altitude Tracking Scopes

While there are altimeters available, there have been requests from schools for tracking scopes. I suppose it has to do with the desire to teach the concepts of trigonometry and mathematics. Again, this is a small market, but it is there for someone that wants to go after it.

The Pitfalls Of Being In Business

I've given you a lot of ideas on what kind of products to make and where there isn't a lot of competition from other suppliers. If you want to take the plunge and get into the rocket business, I think these areas would give you the best chance of building a company with long term success.

But starting and being in business has a lot of obstacles. I'm sure you've seen the statistics; about 90 percent of all new businesses go broke within 5 years. Business is a tough contact-sport, so be sure you know what you're getting into. If times are tough for you now, they could get a lot tougher if you sink your savings into a business and you don't show any return for it. Think about it.

The good news is that in rocketry it may be a little better than that average. That is based on my own personal observations as a competitor to these other companies. I'd like for them to go out of business fast, but they don't. I think the reason why is because the technical aspects of rocketry sort of weed out the dumb people. If you're in rocketry, you're on the higher end of the I.Q. spectrum.

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Most rocketry businesses start out as garage operations, and this can have a lot of advantages. The biggest is the reduced overhead costs (like renting a building, paying for electricity, and other expenses). That is great when you're starting out. I went that route when I took over Apogee Components in the early 1990's (see www. ApogeeRockets.com/Education/Downloads/Newsletter 41.pdf). But if you are going to be a manufacturer of fiberglass nose cones, you'll probably run out of space in your garage pretty quickly and be forced to look for a bigger place.

I just want to give you a tip that may give you some advantages. Find a partner. Not necessarily a partner in the traditional sense. I'm thinking of joint ventures. There are manufactures and vendors that would love to create joint ventures with you. I'm thinking of Apogee Components, but there are probably plenty of others.

Let me give you an example. You're going to be a specialist in one area of business. Maybe you are an electrical engineer and are good at designing gizmos. Or maybe you're really good at sourcing component parts from other vendors (a really nice skill to have in today's import/export world). But you may not be good at selling or doing the order fulfillment. What would be good for you is to create a joint venture with a company that is better at those things.

Here at Apogee Components, I'm always looking for manufacturers that have good products and are willing to let us handle the sales of the items. That is our specialty. Their specialty is creating and manufacturing the product, and our specialties are marketing, selling, and shipping the products. Those kind of deals work well for Apogee Components in joint venture agreements.

What doesn't work for me is when someone comes to Apogee for us to manufacturer their idea (like a rocket kit). We can do it, but it isn't my specialty, and I'd rather not do it. So I turn them down. Once they manufacture it or get someone else to make it for them, I'd be happy to help them sell it.

Why Give Away My Secret Wish List?

One question I haven't addressed yet is why I'd give out my secret wish list of products that I think someone could create a company around. After all, by doing this I'm showing my cards and letting other manufacturers know how they can improve their own business.

The reason is I'm actively looking for manufacturers that I can do joint ventures with. I want to find someone that is willing to take a risk and create those kind of products that are on my wish list. Maybe they will like to do a joint

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venture with me and let me sell the items for them. I think this is a win-win situation. The worst case scenario would be for someone to make these products and not want to do business with Apogee Components. That is possible, but I think the advantages of working with Apogee would outweigh what they could do on their own.

Conclusion

You may have a great job already and aren't interested in being in the manufacturing end of rocketry. That is great news, and I'm really happy for you. You can look at this article as a prediction of the kinds of things that may be coming down the road in the way of rocketry products. I am certainly working on my end to get them moving along.

But if the economy is getting you down, I just want to point out that there are opportunities in the rocket industry where you can make some money. Right now things are looking up for the rocket industry and the future is pretty exciting. After all, as a group, rocketeers took on the BATFE and won a significant legal battle. That removes a big hassle of buying and storing big rocket motors, and should breathe extra life into the hobby. It has inspired me to do some new projects.

If you are interested in doing a joint venture with Apogee Components after you've manufactured your great new product, please feel free to contact me. Business right now is good. This is rocketry after all, and things are going to go sky high!

About The Author:

Tim Van Milligan (a.k.a. "Mr. Rocket") is a real rocket scientist who likes 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. 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 a FREE e-zine newsletter about model rockets. You can subscribe to the e-zine at the Apogee Components web site or by sending an e-mail to: ezine@apogeerockets.com with "SUBSCRIBE" as the subject line of the message.

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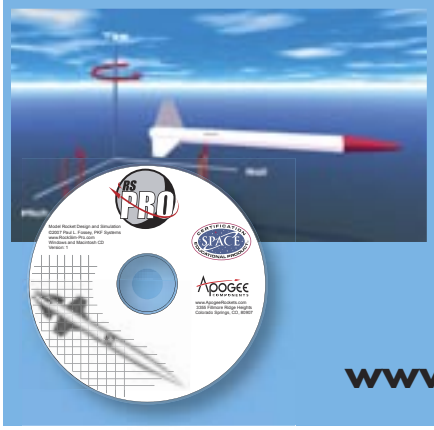

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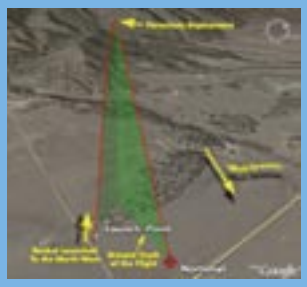

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Your Rocketry Questions and Suggestions

By Tim Van Milligan

Alex D. asks: *"I have never been to a rocket club meeting or read about this subject, but the rocket tube diameters are confusing to me. I don't understand how to know which tube is a "BT-55" or which one is a "BT-80". Please help!"*

For a newcomer to rocketry, this is the most confusing part. Even learning "rocket science" is easier than learning the silly names that manufacturers give to parts. The names of the tubes are just terrible, because the nomenclature doesn't stand for anything useful. Estes created the names, but pretty much every manufacturer is adding to the confusion. I'll even confess that some of our part names here at Apogee Components could have been better. But for tubes, we try to use mm in the names. For example, a tube that will hold a 24mm motor (an Estes D) starts with the designation AT-24. Any number after that is the length of the tube in inches. For example, an AT-24/18 is a tube that holds a 24mm motor and is 18 inches long.

Mixing mm and inches probably wasn't a good idea. But my brain still thinks of length in terms of inches, not millimeters.

In the case of the Estes nomenclature, it gets even worse. Not only doesn't the BT-55 stand for any dimension, they go further and add a letter after the "55" to designate the length of the tube. For example, there is a tube called the: BT-55S. How long is it? Great question. I don't know off the top of my head either.

To be honest, I don't have any suggestions for you to make this process easier. All I can do is point you to a web page that has the stock dimensions for the various Estes tube sizes. Once you know the sizes, then you can get down to business building and flying rockets. Here is the link: http://ninfinger.org/rockets/body_tubes.html.

Other than that, I suggest you get your tubes from our web site, as we have the dimensions all in one place (see the advertisement for body tubes on this page).

Charles C. asks: *"How do you get Krazy Glue to dry on a plastic parachute so it doesn't stick to itself or the inside of the body tube?"*

Krazy glue won't stick to polyethylene plastic (chute material) at all. You have to use stickers to attach the shroud lines. On our kits, we use those little paper reinforcement rings attached to the plastic. Then we recommend punching a hole through the plastic and tying the shroud lines through the hole in the plastic.

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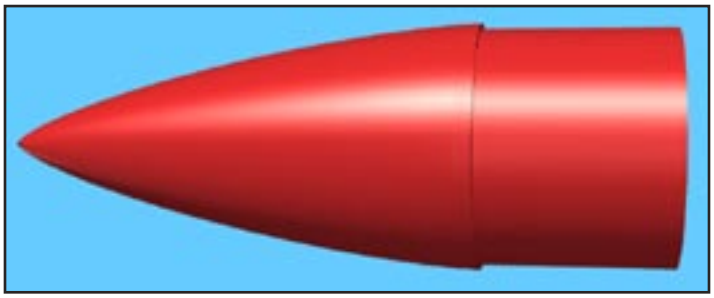
Your Questions and Suggestions

Charles wrote back: *"I used Krazy glue to attach the shock cord to the inside of the body. I added a little Gorilla Glue 'just in case.' Unfortunately, it was still sticky when I inserted the plastic chute for a fit-check. Upon removing the chute from the body, I found the sticky glue on the plastic chute and it wanted to stick together. I spread it out and immediately placed ice cubes on it. It hardened the glue. I also inserted an ice cube into the body and hardened the glue inside."*

My Response: My guess is that the stickiness wasn't the Krazy glue, but the Gorilla Glue. It is a urethane glue that needs moisture to fully cure. Putting the ice cube on it was a great idea. Thanks for that tip. Here in Colorado where it is very dry, that extra moisture from the ice cube would probably be a great advantage.



Firgue 1: The Von Karman nose cone shape.

A word of caution on the shock cords. I personally don't use super glues to attach them to the rocket. Super glues can make the shock cords brittle and more prone to failure. I like to use wood glue or white glue to attach them in the rocket. My suggestion, since yours is already attached to the rocket is to inspect the rocket carefully between flights. Give a hard tug on each end of the shock cord between flights prior to prepping the model.

Phil Vukovick asks: *"Do you know of any programs that draw templates or patterns that I can use for cutting out fiberglass layers for my von carmen nose cone? It's not an easy shape to wrap as you get folds in the material."*

I do not know of any programs. But you might do a search on parachute gore patterns. Those might be modified and might be closer to what you are looking for.

You can also use RockSim to export a side view of the nose cone. If you use that as a pattern and cut a little wide around the perimeter, you might get something that lays flatter. But you'll need to do a lot of overlapping of layers to get uniform thickness of the cloth on your pattern.

If you as a reader know of any other suggestions, please send them in and I'll share them with other readers of this newsletter.