Apogee Components

PEAK OF FLIGHT

NEWSLETTER

In This Issue

Build The Flip-Clip Engine Retainer

Estes Designers: The Lost Interview

Cover Photo: Aerotech Strong-Arm Rocket Kit. Get one at:
www.ApogeeRockets.com/Rocket_Kits/Skill_Level_3_Kits/Strong_Arm

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 326 NOVEMBER 20, 2012

Build A Flip-Clip Engine Retainer

By Ed Rushin

After reading Peak of Flight issue 317 (www.ApogeeRockets.com/Education/Downloads/Newsletter317.pdf) with the engine retainer article by Chris Michielssen, I began searching the house for any empty water bottles to try this new technique. Having found a couple I installed them on some rockets I was building. They worked great. But I thought why stop at 18mm? Isn't bigger better? Retracing my steps netted some larger bottles that could handle a 38mm engine and some for 24mm. I love to re-purpose used articles.

Then I thought what about smaller engines or body tubes? Namely BT-5 and BT-20. Well, so far I haven't found any small bottles that will work. Then my mind started to ponder. What could be built that is small, simple, reliable and CHEAP.

After a day or two of brainstorming an idea took form using a jumbo metal paper clip and 1/8" brass tubing.

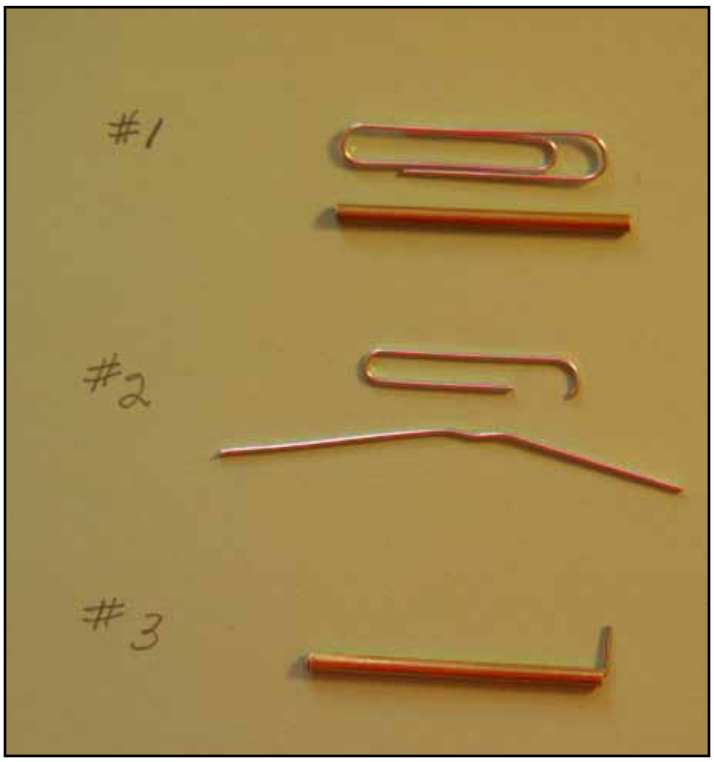


Photo 1: The parts and the step numbers to make the Flip-Clip engine retainer.

So far it fit all the criteria. The were plenty of paper clips around the house and I just happened to have a scrap piece of brass tubing from another hobby project. Now will the idea work in real life?

In Photo 1 are the parts in three general steps. The top portion, labeled #1 is the raw pieces. In the middle, the parts labeled #2 shows the paper clip cut to length and partially straightened (more about this later). At the bottom, labeled #3, is the final product. Now for the nitty-gritty of assembly.

Step #1: Obtain and cut a 1.5" to 2" piece of 1/8" brass tubing. De-burr the cut piece inside and out. Doing this will allow the paper clip to rotate freely.

Step #2: Cut off the paper clip at the second bend. This should yield a u-shaped piece totaling about 3" long.

Step #3: Straighten the paper clip until there is slight droop (about 1/4" should be plenty) at both ends. See #2 in Photo 1. Test fit the straightened paper clip in the brass tube to see if there is a snug fit. If not, adjust the bend until it is. You want the clip to be able to rotate but not freely swing around on its own. There should be some resistance to turning the clip.

Step #4: Position the clip so there is an equal amount on both ends of the tube. With a small pliers(I used a needle nose type) bend one end to a 90 degree angle. Test to see if the fit is still snug. If not it is easy to pull out and bend for a tighter fit. Remember snug is better then loose.

Step #5: Once you have the clip with a snug fit, push the bent end as far in as it will go. Hold the tube with the bent end facing down. Bend the straight end to a 90 degree angle in the opposite direction from the first bend. Test to see that the clip doesn't slip up or down. You need a tight fit here. If it does slip fix it or start over.

Now for the tough part. You have to decide which end to trim. Once you decide take a pair if nippers and trim off the excess paper clip. Place the nippers with the flat side on the tube and the concave side facing up. This will trim the clip flush with the outside wall and leave a nub to grab

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

Build the Flip-Clip Engine Retainer

the edge of the tube and keep it from falling out of the tube. I suggest you wear some eye protection for this step because the trimmed piece comes off at a high velocity. In Photo 1 the bottom part, labled #3, shows what the finished engine retainer looks like.

Step #6: You are now ready to install the engine retainer. It can be retrofitted or installed new. Internal and

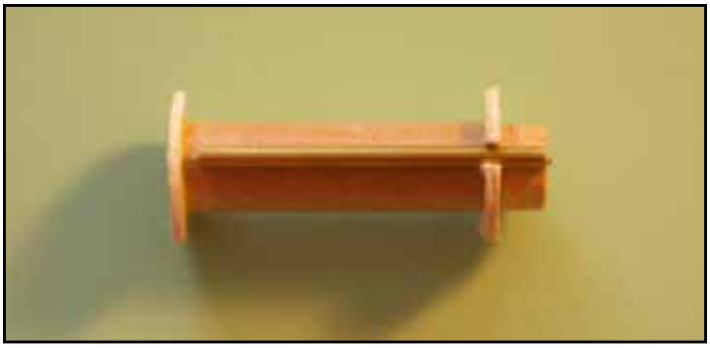


Photo 2: The brass tube is glued along the engine mount tube.

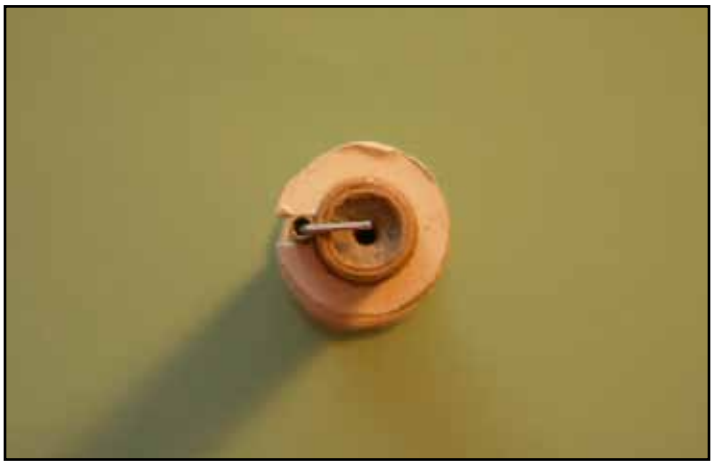


Photo 3: Base view of the swivel engine clip installed on a engine mount for a 13mm engine.

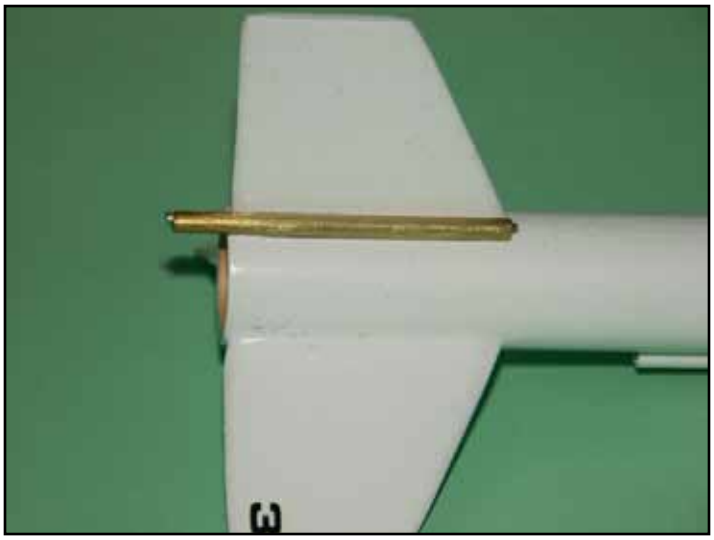


Photo 4: The Flip-Clip engine retainer mounted on the outside of a 18mm diameter (BT-20 size) rocket.

external fitting work equally well. Photo 2 and Photo 3 show an internal mount on a BT-5 engine mount for a BT-20 rocket body. Photo 4 shows an external mount on a BT-20 body tube. To install, simply sand the brass tube to roughen it up. Place an engine in the engine tube. It should extend out of the tube 1⁄4” to 1⁄2”. Adjust to your preference.

Test fit the retainer, making sure the bent part is over the end of the engine. Now simply position the clip, apply some CA and allow to dry. Be careful not to get any glue on the ends of the tube, as that could glue the clip and tube together. If you want, some epoxy could be applied to reinforce the CA.

Photos 5 and 6 show the clip in open and closed positions. You should be able to rotate the clip 180 degrees.

Step #7. Trim of any excess piece of the clip. Usually 1/4” is left to hold the engine in place (see Photos 5 and

Continued on page 4

Continued from page 3

Build the Flip-Clip Engine Retainer

Photo 5: Base view of the Flip-Clip in the open position to allow the motor to be removed.

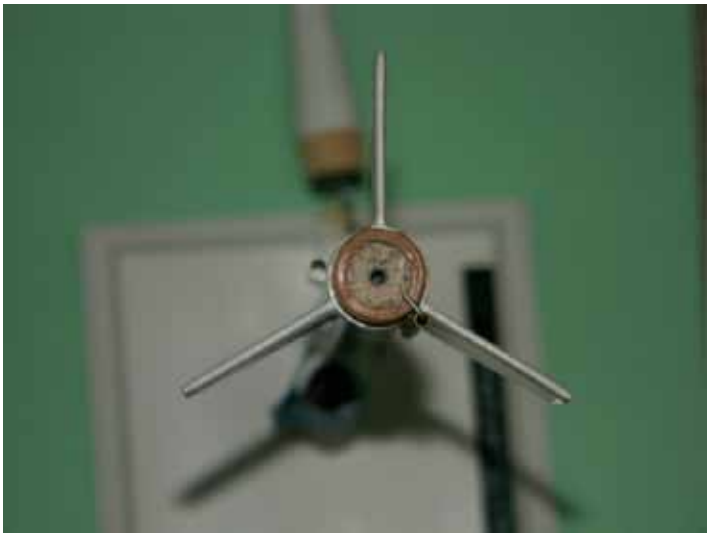


Photo 6: Base view of the Flip-Clip in the closed position to hold the motor in place.

6). The amount trimmed will depend on how far away you mount the clip from the engine tube.

These Flip-Clips fit nicely on the outside of BT-5 and BT-20 body tubes. I've also put them between a BT-20 and BT-50 tube but had to sand the side of the tubing to keep them from bowing the BT-50. They are advantageous on the BT-5 body tubes as it merely flips from side-to-side and stays put until moved. No pulling on a spring clip and holding it out of the way. No friction fitting or tape required. They can easily be used on larger rockets.

Now let's talk cost. Regular engine clips go for $4.03 for 6 assorted clips (www.ApogeeRockets.com/Building_Supplies/Motor_Retainers_Hooks/Engine_Hooks/Standard_Engine_Hooks). That's 67 cents for each. If you buy brass tubing at $3.20 for a 3 foot piece the cost is around 18 cents for a 2" piece and 14 cents for a 1.5" piece. The cost of the paper clip should be around a penny each. If you factor in any sales tax the cost will go up 1 to 2 cents each per completed engine clip. Total cost should be 21 to 25 cents for a 2" piece. Aluminum tubing could be used and the price goes down to 13 to 15 cents for a 2" piece. Be careful with aluminum as it is softer and can be dented or bent easier than brass.

I hope you find this way of holding engines in place works for you. It's a little more work up front but you won't have to cut slots in body tubes or strap it down on the engine tube. You should be able to complete a FLIP-CLIP in 10 minutes or less.

Author: Ed Rushin

Estes Designers: The Lost Interview

By Matt Steele

Back when *LAUNCH* magazine was in circulation, Matt Steele sat down in late 2006 with Dave Meyers and Mike Hellmund and discussed their time together at Estes when they were actively designing kits. Along with the late Mike Dorffler, Ron McClaren and Apogee's own Tim Van Milligan, this group designed many of the new kits introduced between 1990 and 2000. The entire interview was intended to be in a future issue of *LAUNCH* magazine, but the magazine folded before this article ran. Below is a portion of the transcript of the interview.

MATT STEELE: Dave, tell me about some of the products you designed at Estes.

DAVE MEYERS: I did the Astroblaster first, then the Stratoblaster, and then the Sweet V. I think those were the three straight RC winged products. I also designed the Tomcat, ARB Condor, and a couple of a couple of Star Wars kits.

MATT STEELE: Did you do the Trans-Wing?

DAVE MEYERS: Oh, yes, I designed the Trans-Wing. I also did some Cox products: the Cub, the Extra 500, the Apache Helicopter, and the Star Wars Snowspeeder.

MIKE HELLMUND: Didn't we do a Comanche?

DAVE MEYERS: That's right, the free-flight Comanche. I guess the Cox product was Apache.

MATT STEELE: But you came to Estes with more than just rocket skills.

DAVE MEYERS: I came to Estes in 1992, because of my work on the Astroblaster as an outside consultant. Mike Riggs brought the Astroblaster project to me, to make it work. Apparently I made it work well enough to be hired. I was looking for a way out of the Los Angeles area at the time, and it came along at the perfect time. It was in May of '92.

Photo 1: Left-to-right: Dave Meyers, Matt Steele, and Mike Hellmund.

MATT STEELE: And Mike, which products did you design?

MIKE HELLMUND: One of my first main jobs was writing the catalogue and editing the *Model Rocket News.* With the ARV Condor—being in marketing, we'd go up to Dave and say, 'we want a rocket that has two gliders on it' and Dave would take that and—occasionally he'd look through the old catalogues to see what we'd done—and he'd whip something up. I remember with the ARV Condor he came up with those gull-wing gliders; sitting in the R&D meeting he'd glide them right across the table. 'Oh yeah, that looks pretty good!'

The thing with Dave is that he'd come up with these neat things and then we'd have to—or at least Dave would have to—go back and figure out how to build them! Because we had to remind Dave, 'remember, these are ten-year-olds or eleven-year-olds'. I know with the ARV Condor we came up with jigs and stuff to get the dihedral just right. A lot of the things when I came in were, we would sit there

Continued on page 6

Continued from page 5

Estes Designers: The Lost Interview

and go, 'you know, this is an old classic, let's do this one.'

You know when I came on board the Mars Snooper was already out, and I remember my interview was when they showed me the Maxi Force and the Impulse and the Patriot (the original Pro Series line). They'd just started to come out with those cluster-D rockets. It was also the start of the Bandit, the Rampage, and the Dagger, in the E2X line. There was also the two-stage D rocket, the *Delta Clipper* – a two-stage design with the through-the-body-tube fins. You often lost the top stage because the thing went so high, but kids thought it was cool. It was a really rugged rocket. It took a lot of punch. Dave, did you work on the Air Walker? That was a rocket—did you do any rocket rockets?

DAVE MEYERS: Oh, yeah, a few, but they were relatively insignificant.

MATT STEELE: The launcher and the rocket for the Mighty Mites?

DAVE MEYERS: I did a couple of little rockets for the rail launcher (of the Mighty Mites Outlaw Starter Set).

MATT STEELE: And you designed the rail launchers?

DAVE MEYERS: That's right. I also did a redesign on the standard launcher towards the end of my career there. I also did a number of other little small rockets. Every once in a while there was a blast to have a bunch of little bagged kits and so I did a few of those. You know, along with décor changes and all that.

MIKE HELLMUND: That was that whole year when I first worked there with the whole Beta lineup. And I was part of that, coming up with new skill level names. Because we wanted to move away from—we didn't think that skill level 1 or 2 or 3 meant anything, and so we wanted to associate that with names. And so that gave rise to E2X, Beta line—which that didn't last very long. Going back to the old skill level 1, 2, 3, or skill level 0, I guess it was each [something] skill level 1, 2 3. But that's when we redid the whole skill level 1 line, decorated them. That was with Rob Akey, Mike Riggs and Dave Meyers. We redid the décor—we would suggest décor to R&D.

I was hired originally—the original concept was that I was going to be sent out in a van—in a minivan—and travel through the country doing demos. The Rocket Doctor!

MATT STEELE: The original Rocket Doctor?

MIKE HELLMUND: I was going to go across the country. When we started there, it was like there was a big push to revamp the line. Quest was coming on line, and so John Carroll, who was the educational manager— I guess

Continued on page 7

Continued from page 6

Estes Designers: The Lost Interview

at one point we were the biggest buyer of Quest products throughout the country, because we had bought all this Quest product to basically put it under the microscope and see what was good about it and what wasn't. That was a time when the marketing department was basically one person and this was the same time that Bob Cannon passed away. And so when that happened, it was decided—that it was John Carroll who did the education side of the house. I guess what was unique was that when I joined Estes, the marketing department had someone who came from the hobby—competed at NARAMs, had flown as a hobbyist as a long time.

MATT STEELE: And that hadn't really been that way before.

MIKE HELLMUND: No, it really hadn't been that way before. There really hadn't been anybody who was a serious rocketeer—well, Bob Cannon was, he had a terrific impact—and Mary Roberts did, her and Robert. So John Carroll and I had flown rockets, and we had started the Colorado Rocketry Association.

MATT STEELE: And what year was this?

MIKE HELLMUND: It was the end of 1991. I was a couple of months before Dave came on board.

MATT STEELE: Because I didn't get there until 1993.

MIKE HELLMUND: Right. Dave was introduced when—with the Astroblaster. Dave demoed the Astroblaster and we were all impressed with the increase in performance.

MATT STEELE: You did more than rockets at Estes, too, didn't you? All the light-flyers,

MIKE HELLMUND: Later on, I did those—I did a lot with the West Wings balsa airplanes, Dave also had a hand in that too.

Photo 2: Dave Meyers works on a flying wing rocket-glider. This design never made it into production.

MIKE HELLMUND: And then we brought in some of those rubber-band free flight gliders from Korea. Those were the bamboo frames with the tissue paper—

MATT STEELE: And that actually moved to foam. Didn't you do one of the foam glider designs at the end?

MIKE HELLMUND: No, that was after my time. We basically rebadged some existing rubber band powered kits. My main thing was also making sure that kids could put the kits together, and also interacting with the rocketeers that were out there, and continue to the MRN the first couple years I was there. We kept on doing the design of

Continued on page 8

We're Paying Cash

For Great Articles for This Newsletter

Are you a writer looking for some serious pocket change? We're paying up to $350 for good how-to articles for this newsletter. If you're interested, see our submission guidelines on the Apogee web site.

www.ApogeeRockets.com/Newsletter/Newsletter_Guidelines

Continued from page 7

Estes Designers: The Lost Interview

the month, and of course setting up that educational retail program.

MATT STEELE: Well, let me go a little different direction - what was your favorite design out of all the stuff that you did?

DAVE MEYERS: Well, my expertise was really in the radio-controlled stuff, and while I did other things—I did a number of other things that were almost straight toys. You remember that bomb-drop thing that flew on the end of a wire, and there were quite a few projects that went on for quite a time but then never really happened—that were not rocket related, actually. But I've got to say, that since my main expertise was radio controlled stuff, that it has to be the radio controlled planes, primarily the Sweet Vee because that was a real-live, genuine, radio controlled airplane that performed really really well. It was stifled a little bit by the rocket power for getting into decent altitude, but it was an excellent flying airplane.

MATT STEELE: I see those go for about double the price on eBay now. Estes has recently reintroduced the Astroblaster and the Stratoblaster as ready-to-fly products but the Sweet Vees never been remanufactured after the initial production runs. If you see one on eBay, it's easily double what the list price was, if not more. So there are still folks out there that really like them, there's no doubt about it. Mike, what was your favorite?

MIKE HELLMUND: What I enjoyed most was trying to come up with the classic kits. Obviously the Mars Snooper, and after that the next one was Honest John (?) and then eventually working on the V-2. One product that never made it to market was the Saturn 1B.

MATT STEELE: You brought that out to NARAM and test flew that one year (NARAM 34 in 1992), what was that, 1/45 scale or something?

MIKE HELLMUND: It was using the Centuri Little Joe 2 capsule, 1/45 scale, that's right. Really nicely done, very lightweight, a tad under 2 pounds. And that was going to be one of the precursors to the composites that we were working on. That of course was before North Coast. That was when we were working with Vulcan Systems I believe, and with some of the stuff that Mike Dorffler had been doing too for composite motors.

Unfortunately, the transcript ends here, despite the fact the conversation went on for over two hours. Maybe Mark Mayfield can find the tape and have the rest of the interview transcribed! If not, at least this part of the interview remains.

About the Author and Inteviewer:

Matt Steele is the owner of North Coast Rocketry. These kits are available exclusively from Apogee Components (www. ApogeeRockets.com/North_Coast_Rocketry).

Part 2 - Tim's Estes Adventures

Most long-time rocketeers know that I also worked at Estes Industries as a designer. Since Matt's portion of this article mentioned my name, I suppose you're wondering about my escapades.

Before I go into that, you might want to get a glimpse of my first rocketry experience so you have some historical perspective. A brief history of my early life can be found in Newsletter #231 (www.ApogeeRockets.com/Education/Downloads/Newsletter231.pdf).

My Job At Estes

I was actually hired at Estes in the summer of 1991 before Dave, Mike, and Matt came on board.

Continued on page 9

Continued from page 8

Estes Designers: The Lost Interview

In the R&D department when I started were Ron McClaren, Mike Dorffler, and Rudl Mergleman. Rudl was the boss of the department, but he was let go about a month after I started. Mike Riggs, who was mentioned by Mike Hellmund previously, was hired to fill that empty position. Mike Riggs was an acquantence of Dave Meyers, which was how he came on board at Estes.

Ron McClaren was a gifted artist, and he taught me a lot about building rockets. He told me he started out in the Art Department, and then migrated to the R&D department after they found he was too talented to be writing instructions and doing package graphics.

Ron did so many different kits, that I was always learning something new. When I started, Ron had done most of the work on the Pro Series kits (Impulse, Maxi-Force, and Patriot). Being the new kid, I had to learn the Estes way of doing things, so I helped Ron finish them up.

"The finishing up" part is the hard and laborious part of designing rockets. Coming up with the design and creating a simple rocket kit is pretty easy, but that is only 1% of the job. You have to create bills-of-materials, write specifications on the new parts, source the parts, haggle with the purchasing department, inspect any new parts, write the instructions, review and correct the instructions and the packaging, build the photo-models, interface with the marketing department to write the advertising copy, attend umpteen meetings to inform the sales department what they are selling, and about a thousand other tasks that are required.

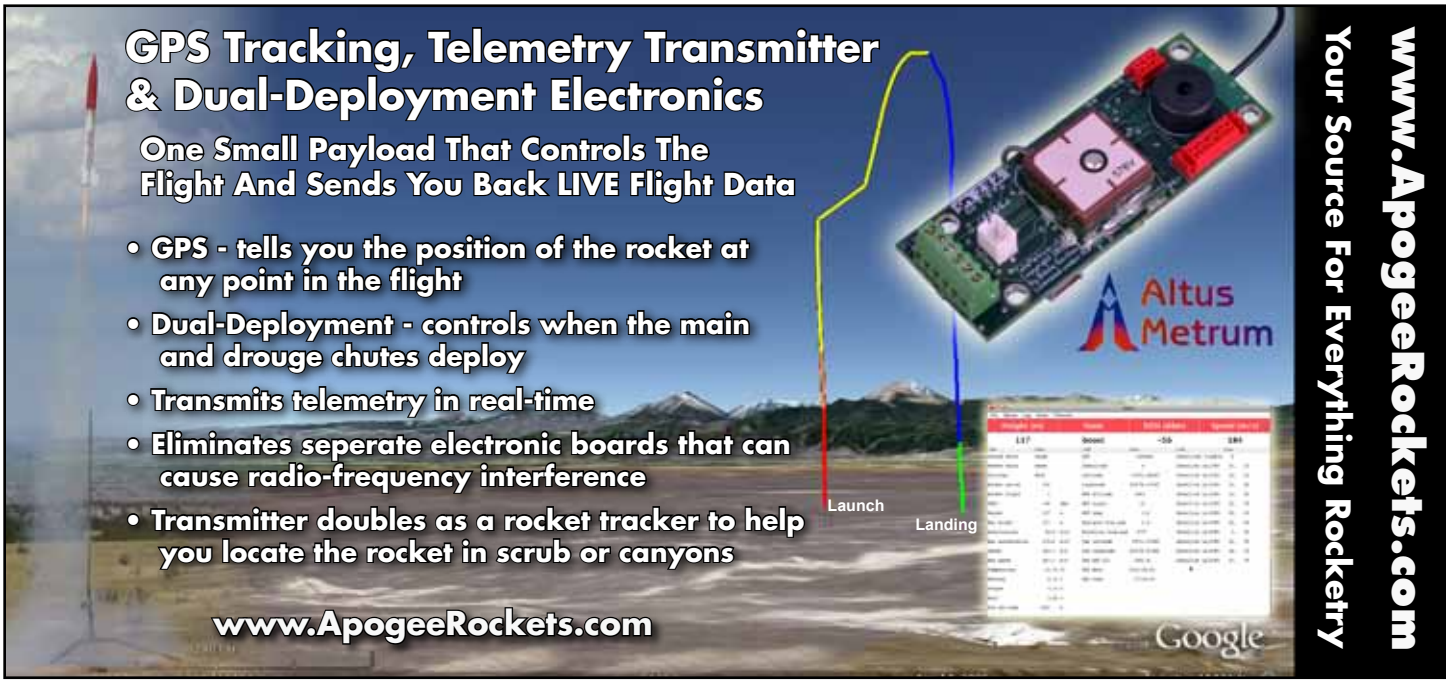
Nobody likes that aspect of the job. In fact, that is one of the big reasons that I don't buy rocket designs here at Apogee Components. I'd be "finishing up" on someone elses' project, doing 99% of the real work. While there are a lot of talented designers out there, following through on a project, all the way through to the end is tough. You don't know how tough it is, until you start a rocket company and have to do everything yourself.

Photo 3: Tim Van Milligan in 1993 at Estes. This is another flying wing RC rocket that never made it into production.

After designing a few rockets, the grind kicks in, and you'd like a person to help you with the grunt work too. I did a lot of "finishing up" on kits that people give me credit for. The Delta Clipper model, that Mike Hellmund mentioned previously, was one that someone else started.

The re-release of the Star Trek models (USS Enterprise and Klingon Battle Cruiser) were also a couple kits that I

Continued on page 10



Continued from page 9

Estes Designers: The Lost Interview

did. It was a bigger job than everyone anticipated, because the tooling had to be regenerated.

Estes has so many old parts that putting out a 'new' kit isn't that hard. The Terrier-Sandhawk kit that I did was a case in point. The Terrior portion was already done (as a previous kit), so all I had to create was the Sandhawk section of the rocket.

I was also involved in the kit-upgrades that Mike also mentioned previously. When Quest jumped into the market, I was tasked with going through all the kits and seeing how we could improve to match what Quest had done. A lot of it was cosmetic, such as color-coding the parts in the kits, utilizing multi-colored instruction sheets, and switching from rubber shock cords to elastic. But again, putting these improvements into all the kits was a laborious grunt-work job.

The two kits that I'm the most pleased with, were the *Skywinder* and the CATO.

The CATO was the first kit I developed on my own. It was based on a plan called the *Missile Impossible,* which was in an old Centuri design book. It was designed to blow apart like an explosion when the engine burned out. It worked really well, and the effect was striking.

I recall a lot of haggling with the purchasing department over the injection mold tooling. They went with a new vendor that was low-balling the price. It was a nightmare trying to get the parts in. I think that was the reason the kit was discontinued in a few years, because they just couldn't get good parts from the supplier.

The *Skywinder* was a lot of fun to make. It was a novel design, because I wanted to make it an entry-level rocket, but utilizing helicopter recovery. That meant that it would have to use a lot of pre-molded plastic parts.

This time, the purchasing department did go with a better tool maker, and the result was much better. The rocket had an incredible start, selling over 80,000 units!

Mike Dorffler - Super Genius

The best part of working at Estes was being around Mike Dorffler.

Mike Dorffler was the genius in the department. Everything you've heard about him was true. And then some...

The thing that was unique about Mike, and what I've tried to learn from him, was that he had a great handle on the marketplace. He anticipated what customers wanted, and was mostly right. Therefore, everyone at Estes would bounce ideas off of him.

He was also a work-aholic. And he couldn't turn off his brain, even when he left the office. It was a treat to car pool with him to work every day, because I got to pick his brain without any interruptions. He'd always make excellent suggestions, and say something like: "Tim, you know what you ought to do? If you did ...." But he never took credit for the suggestions he made.

My Demise At Estes

During those years that I worked at Estes, the turnover of the staff was pretty high. You'd get to know someone, and then one day, they'd be fired. As I mentioned, my first boss at Estes was gone withing a month of my arrival. He was also a talented guy that I learned a lot from.

After him, my boss was Mike Riggs. He didn't last long either. Then the R&D department was managed by Rob Akey, who was head of the Art Department. But Rob got tired of the politics, and he moved away from from the company. So then all of us in R&D reported directly to the President of the company.

Continued on page 11

Continued from page 10

Estes Designers: The Lost Interview

My downfall came when I got tired of seeing so many talented people get fired. We stopped keeping track of the names and faces after the first 35 people were replaced. So being young and stupid, I thought I could change things by writing a letter to the Board of Trustees.

That didn't go well...

The President called me into his office one morning in March of 1994, and fired me on the spot. In retrospect, I had it coming to me.

The lesson I learned was that you don't go over the head of your boss. There is a chain of authority, and you don't change it by making your boss look bad.

I think I was gone just about the time that Matt Steele came into the company.

Photo 4: John Boren, the current head of R&D at Estes, talks to customers at his booth at NARCON-2012.

Estes After My Departure

The last few years has seen a significant change at Estes. They were sold to a new company, and it has been a breath of fresh air to the staff. I'm sure you've seen a lot of the great variety of products coming out of Penrose, Colorado.

The man currently running the R&D Department at Estes is John Boren. If you get out to a NAR launch, or a NARCON, you'll probably meet John there.

I have to say that John has more design talent and passion than any three people combined. He's more talented a designer than I ever was. And he's been churning out a lot of products that even I get excited about.

How to Design A Rocket Kit?

In March of 2011, at the NARCON event in Seattle, Washington, John Boren, Bill Stine, and Bill Simon gave a talk about how rocket kits are designed at Estes. If you're interested in that talk, you can watch it on the Apogee Components' YouTube channel (http://youtu.be/dxHBNjooY7Q). It runs about an hour long, and you'll get some great history of the company, and the process as to how rocket kits are created.

Want To Be A Rocket Designer?

Being a rocket designer is fun. But to make any money at it, you have to know what the customer wants. Great ideas always start by knowing what the customer will buy.

If you want to start your own rocket company to design rocketry products, you can get some great product ideas in my previous article: "What Products Are Needed In The Rocket Industry" found in Peak-of-Flight Newsletter #234 (www.ApogeeRockets.com/Education/Downloads/Newsletter234.pdf). It will help you avoid a lot of mistakes by giving you hints as to what customers really want.

Wanted: Your Rocket Products

If you're a manufacturer of rocketry products, like kits, electronic payloads, parts, construction tools, motors, launch equipment, or something totally cool, we're interested in talking to you. We're always looking for new products to sell.

So why have Apogee sell your products?

- *We have the best customers that are looking for someting new.*
- *We provide the product support for the customers, so you don't have to.*
- *We take care of all of the hassles, so you can focus on what you do best.*
- *We are a volume seller - Our web traffic means buyers will find you easier.*
- *Our endorsement means you sell more and make more money!*

APOGEE COMPONENTS

www.ApogeeRockets.com

If you're not getting enough sales on your own, let's talk.