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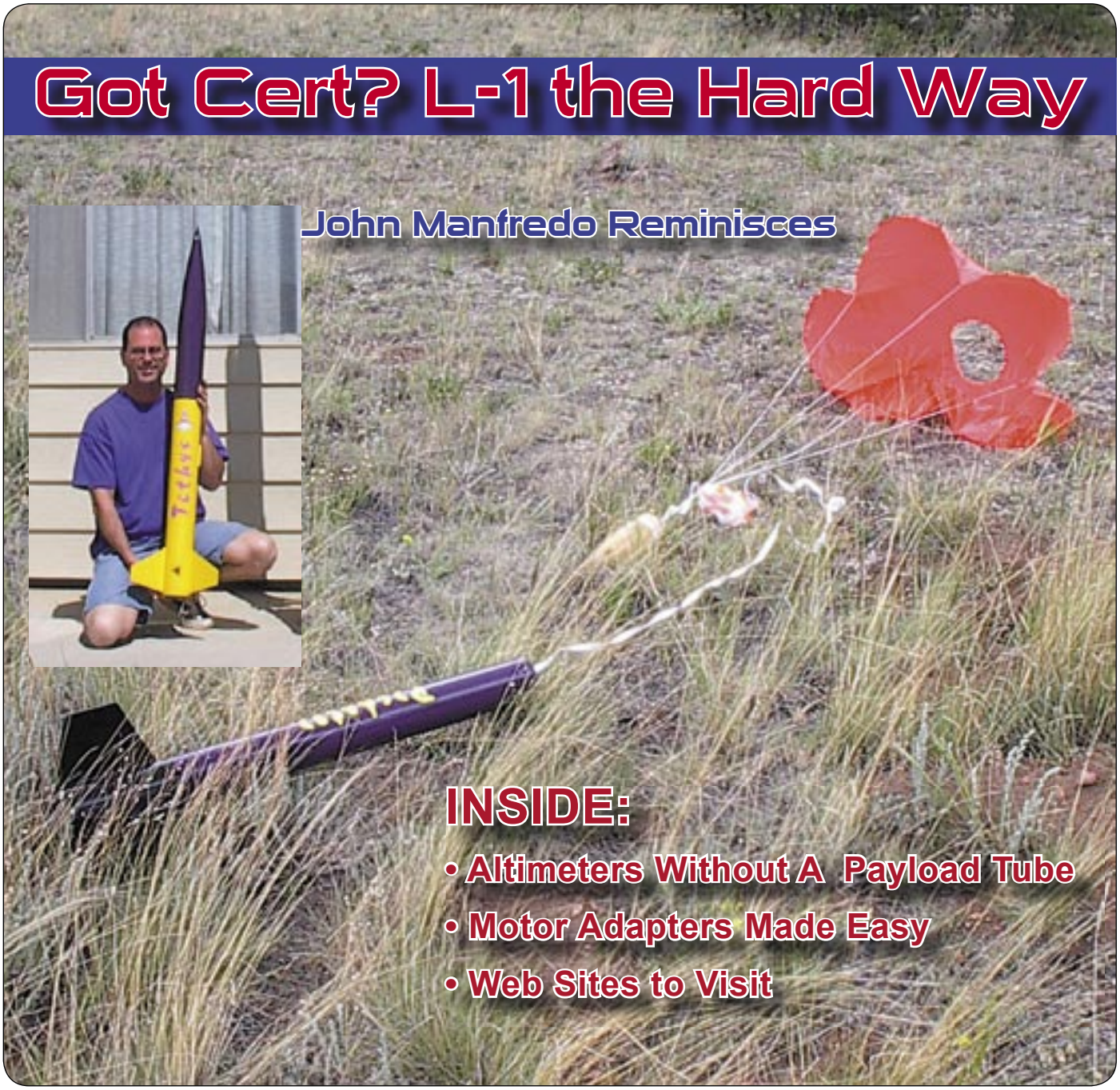
APOGEE PEAK OF FLIGHT NEWSLETTER



Got Cert? L-1 the Hard Way

John Manfredo Reminisces

INSIDE:

- Altimeters Without A Payload Tube
- Motor Adapters Made Easy
- Web Sites to Visit

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Getting Your High Power Certification the Hard Way

(Or Don't Try This At Home)

by John Manfredo

Recently, I was reminiscing about when I became a high power rocketry user. I realize this is nothing new to many people, but I wanted to offer my take on the whole experience as a way of illustrating to readers how not to do this process or at least to try to steer you in a better direction should the high power bug bite you! You see, in order to be able to buy and launch "H" and "I" motors, you must first go through a certification process to prove that you know what you are doing.In July 2002 was when I decided that I wanted to delve into the prospect of getting my level 1 (L-1) high power rocketry certification for "H" and "I" motors. This was also the day I decided to take the long road to high power.

I mentioned that was the day I decided that I wanted to move up to "H" and "I" motors. Well, at that point, I wasn't even a member of a national rocketry association. So, first on the agenda was to decide which organization to go with.

I'm not going to plug one or the other because my point is not to sway rocketeers one way or the other. At the time one appealed to me over the other for a variety of reasons. I found Brad "Rocket Rev" Wilson's advice very helpful to me. See this at http://tripoliquadcities39.com/page5.html. He was very fair in his assessment of both NAR and TRA. By the time you read through this document you'll find that his advice is to go with the organization that fits your needs and interests better. I decided, sent in my application and fee, and soon had my membership in place with a national organization. You can't get to point "B" without going to point "A" first. I was thinking positively so I went ahead and bought a set of 29/180-240 reload casings. In September of 2002, I chose to find out all I could about certifying L-1. Three of my main sources were the publications shown to the right. I found them to be extraordinarily helpful.

Rocketry books to help you on your quest for certification.

For Christmas of 2002, I asked for monetary gifts so that I could pick out and buy a rocket that I felt would suit my needs for a L-1 certification flight. I settled on a PML Tethys, which would still fly on "G" motors but would allow me to fly on "H" and "I" motors as well. In March of 2003, I completed my L-1 rocket as shown below.

John Manfredo with PML "Tethys"

My next project was to find a motor to certify with. Being that I couldn't buy one at this point myself, I neeeded to find another rocketeer who would sell me a motor to certify on. April of 2003 found me posting a message to one of the state's rocketry club news groups to see if I could find a willing person who had a 29mm motor I could buy for my L-1 flight. I had the casings so I thought it wouldn't be that hard to find someone with the reload. My goal was to certify at a launch on May 24th, so time was of the essence in finding a motor. Twice I had leads on cert. motors to buy and use for the flight and twice things fell through. Reloads from businesses are not always readily available in every state, as I soon found out. On May 2nd, I hit pay dirt! I found someone with an H180 in a town about 1 hour away whom I could get the motor from on May 14th. Everything was falling right into place!

My next obstacle to overcome was the witness for my flight. The person I got the motor from could have been my witness, but he was going to be at another launch on that day. One of my problems was that because my rocket weighed over 3.3 lbs., I had to fly it at the field that was sponsored by the

Continued on p. 3

About this Newsletter

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organization that I was not a member of because their field was the only one close by that could accommodate that size. I needed to find someone who was a member of my organization but was willing to go to that field to witness my flight. I put out another message on the news groups and received a response. He agreed to witness my flight at the other field and was certified level 2 with both organizations! Unfortunately, as life goes, something came up with our family and I couldn't make it to the May 24th launch. My goal of doing the flight on May 24th was now down the tubes. I wanted my wife to be at the great event and she couldn't be at any of the launches in June, so now I would set my sights for July. I hit my witness up to be at the July 26th launch, and he said that would be fine. I was back on track once again! Well, I was all set and then July 23rd hit! Did I forget to tell you that 2003 was the year that Colorado had many bad fires going on?

The Hayman fire.
Photo by Kenneth Wyatt - www.wyattphoto.com

It was, and on the 23rd a fire ban was put into place that nixed my chance of certifying on July 26th. August was going to be out because I would be out of town and due to our weather here in Colorado being snowy during the winter, I was starting to see the big picture of running out of months to get my L-1 done! Around the middle of August, I realized that none of the other launch dates at the one field would work for my schedule. Also, things were on hold until they lifted the fire bans, so now I was back to square one of finding a field, a witness, and just waiting it out to see if the bans would be lifted before flying season was over. It was looking like I wasn't meant to get my L-1 cert. at all! But I don't give up that easily.

Toward the end of August, I found a field that could accommodate L-1 flights, I found a rocketeer who was a level 2 flyer (with my organization to boot), and we could get it done at their September 20th launch if the fire bans were lifted. The field was about the same distance away for me to drive, which was nice! I continued to e-mail and speak on the phone to reconfirm that we were set for September. The one hitch besides the ban I had was that this field did not accommodate rockets weighing over 3.3lbs. So now I had to come up with another rocket that was strong enough to take the H180 but was still light enough to fit within the regulations of their flying field. All this and I didn't have any money to buy another rocket to use. That was okay, though. I thought about the possibility of using my scratch-built rocket "Predator" shown in the picture with my son, but the problem with it was that I built it specifically

Matthew Manfredo with John's "Predator" Rocket.

to hold no bigger than a 29/40-120 motor. This rocket is completely scratch-built right down to the cottonwood lathe-turned nose cone and the rip-stop nylon parachute, the latter made for me by my wife.

It has a built-in engine block made with pieces of aluminum strips. It was fabricated in such a way that I thought it would be difficult to take it out. Looking at it further, I decided to try to cut them out with a hacksaw blade and then file them smooth so as not to damage my new 29mm hardware. It worked fine and the last detail was to recheck the weight of the rocket. It came out to 3.23lbs. fully loaded by Rocksim and was confirmed through weighing. So, I just barely made the maximum weight for the proposed flying field. More good news was that the fire ban was lifted. I called my certification witness the night before the launch to reconfirm that he would be there, which he assured me he would. I'm sure you can guess what's coming next.

September 20, 2003 arrived and off we

Continued on p. 4

trekked to the launch field. By the time we arrived (it took us over an hour due to the fact that I had never been there before) the amount of flyers was small. I asked if my certifier was there and I was informed that he had just left not long before our arrival! I couldn't believe it! All these months had come down to a wasted trip just because of a few minutes! I decided to ask around to see if anyone was certified so that they could witness my flight. There was one, but he was only certified L-1. With my organization, I needed either one L-2 member or one L-1 member and another member who could be certified or not. Fortunately for me, there was another member there who was not certified there and they both agreed to be my certification team. They inspected my bird, asked me questions about the construction, and watched me assemble the H180 motor. When all was ready, I loaded my rocket onto the pad and readied myself for the countdown. The countdown started: 5, 4, 3, 2, 1, ...it ripped off the pad like a banshee!

"Predator" lift off.

"Predator" atop a plume of smoke.

It weathercocked a bit but not too bad. The predicted altitude was about 2100' AGL and I think it reached every bit of it. As it arched over, I held my breath to wait for the ejection charge to deploy my homemade 'chute. Just after apogee, the charge went off and the parachute came out! Unfortunately, the parachute was not opening! (In the aftermath I discovered that the small parachute I put in the rocket with my new 36" 'chute became tangled up in it). I watched and yelled at the thing to open up sometime before it impacted the soil! No such luck, though. The bird disappeared from sight over a hill and my cert team and I started the trek to recover the remains of my flight. Making our way over the hill in the heat of the day, we scanned the horizon with no vision of my poor rocket in sight. Delving further into this search, we finally came across the rocket about a half-mile away in the middle of a field, lying in short grass.

John's L-1 rocket after touch-down. The wind finally inflated the parachute on the ground!

We inspected the rocket and found that the only damage to it was a slight crinkle in the body tube and a little chipped paint. There was some discussion between my cert team members and after a debate it was determined that due to the certification rules, I was now certified level 1 high power! The rules state that in order to pass, "In general, the guideline for acceptable flight damage is that the model could be flown again without repair." My rocket could be flown again without repair so I was ecstatic!

Now, let me speak to the larger picture here. The reason I wanted to share my difficult experience with you is to illustrate just how hard and more time consuming it is to try to do these things on your own. I would highly encourage you to get involved in a nearby club. You'll be around others who have the skills, the know-how, and the resources that can help you get certified, become a better rocketeer, or whatever your particular interest may be. I can testify that rocketeers are a great bunch of people and are always willing to help out those who are new to the hobby. Get involved, get kids involved; that's our future! We here in Colorado have some great clubs like COSROCS, Tripoli Colorado, CRASH, SCORE, and NCR that do so much to help out and promote our hobby. There are awesome clubs all over the U.S. and the world! They are made up of such a wide variety of people that you will always find that you have something in common with someone else there. At the very minimum, you know with absolute certainty that one common strand runs through the members of a club...their passion for rocketry!

WEB SITES WORTH VISITING

This issue's web site worth visiting is one that I mention in the "Tip of the Fin" article on page 7. Vernon Knowles' web site is not only a breath of fresh air, but it has many great features, tips, and pictures that one must pause to try to soak it all in. The main page can be found at http://www.vernk.com/index.htm.

The features of this site include an extensive photo gallery, a great video gallery, in-depth pages on the rocketry projects he has been involved in, flight logs, and many pages having to do with rocketry tips.

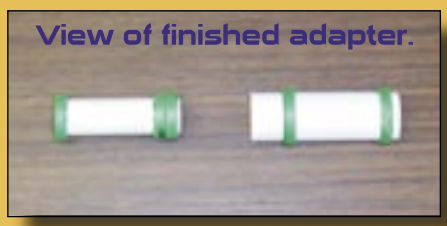
Subjects covered include, but are not limited to, altimeters, ejection charge sizing, hybrids, and parachutes. One really cool page discusses and takes you through construction of an antizipper band. His antizipper band is the band from a steel hose clamp. He just cut off the screwing mechanism. The length of the band was cut to exactly fit the circumference of the body tube. Then after installing the antizipper band, the body tube was wrapped in fiberglass cloth. It looks really slick by the time it's done!

Vern has done an excellent job on this web site and he does keep it up to date. As I'm sure you've noticed, many times up-to-date websites are few and far between. There are some very nice videos and lengthy project design pictures, also. All in all, this is a very nicely designed site. Check it out!

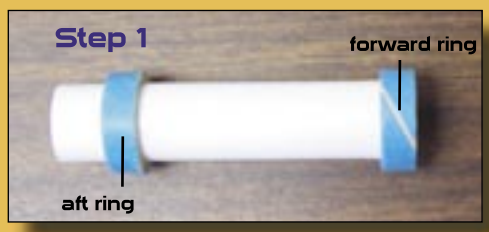
QUESTION AND ANSWER CORNER

We get a lot of questions about how to build motor adapters so that rockets can be flown with more than one size of motor and increase the variety and types of flights you can have. We will go through the steps needed in order to create three different adapters. The first is a 29-24mm, the second is a 24-18mm, and the third is an 18-13mm adapter.

Let's start by taking a look at what one of the finished products will look like. I already have a 24-18mm adapter made in order to give you a visual of the goal.



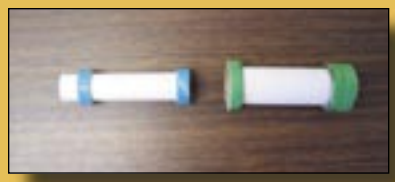
As you can see above, the 24mm motor mount tube on the right is the one that would be glued into the body tube of your rocket and the one on the left is your adapter to allow you to use 18mm motors in the design as well.



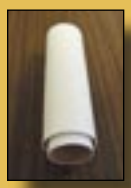
Let's begin by constructing an 18-13mm adapter. Take a 13mm motor mount tube (MMT) (see above) and glue on the centering rings. The forward ring on the right should be flush against the end of the MMT and the aft ring should be positioned so that when it is inserted into the 18mm MMT it is flush or slightly recessed inside the other end of the 18mm MMT. (see below)

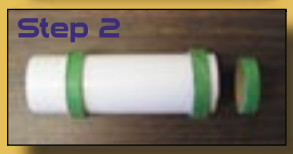
Next you will use a 10.5mm ring to act as an engine block and glue that into the 13mm tube. Position it so that the 13mm motor hangs out the end by about 1/4" when inserted into the 18mm MMT to allow room for taping the motor in. (See Below)

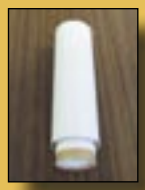
Now you can see what the adapter looks like next to the MMT (see below).



The 29-24mm adapter is made the same way. (see pictures below).







All of the parts used to construct these adapters are available from the Apogee Components web site at http://www.apogeerockets.com/building_supplies.asp

If you have a rocketry related question, please e-mail me at johnm@apogeerockets.com

TIP OF THE FIN

This issue's tip is based on barometric altimeter placement. The idea is centered around how to use an altimeter in a rocket that doesn't have a payload bay. This technique is a combination of different ideas that I have read about or noticed from other rocketeers but no one in particular. This method is primarily designed to work in a situation where your rocket has a piston to guarantee that your altimeter will not become damaged by any hot ejection gasses. Also, the altimeter must be a fairly small unit such as the Perfectflite Alt15K like we sell through Apogee Components as seen above.

The idea is to get a small plastic container such as a 35mm film canister, which will house the altimeter, and drill a static port in it based on the diameter of your rocket. In addition, drill another port in the body tube just below the shoulder of the nose cone. Different people have different philosophies on static ports, which could be an article unto itself. A good general chart can be found on Vernon Knowles' web site at http://www.vernk.com/AltimeterPortSizing.htm. Drill a couple of small holes in the lid of the container. You then need to attach the film can or other container to the nose cone with wire or some other strong material.

Put some foam in for cushioning and tape the top of the container closed so that nothing falls out. Arm your altimeter before inserting, of course, and put the unit and nose cone into your rocket. Keep in mind that this idea is designed to work with a small altimeter.

DEFINING MOMENTS

Piston ejection is the method of ejecting a recovery device from a rocket using a solid, sliding bulkhead. This bulkhead protects the recovery device from the heat of the ejection charge without the use of recovery wadding or ejection baffles.

These can be manufactured or scratch-built and work very well for protecting your parachutes.

PML piston shown above.

Apogee Components, Inc. is pleased to announce that we now offer gift certificates for those people on your gift list that you know won't be satisfied with anything less than all things rocketry! You can purchase the certificates in increments of $25. Ladies, when your husband has too many ties to count, give him the gift of love; give him rockets! Go to http://www.apogeerockets.com/gift_certificates.asp to order.

DYNA STAR

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

Parachutes pictured are actual colors and patterns.