

# PEAK OF FLIGHT

N E W S L E T T E R

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### *What I Got Out of Attending The World Space Modeling Championships*



**Cover Photo: The beautiful launch field at the World Space Modeling Championships in Kaspichan, Bulgaria.**

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# PEAK OF FLIGHT

## What I Got Out of Attending The World Space Modeling Championships

By Tim Van Milligan

I was going to write an article about the cool technology that I saw in Bulgaria a couple of weeks ago at the World Space Modeling Championships (WSMC). You saw some of it in the video on our web site at: [www.ApogeeRockets.com/Advanced\\_Construction\\_videos/Rocketry\\_Video\\_154](http://www.ApogeeRockets.com/Advanced_Construction_videos/Rocketry_Video_154). But there was so much of it, that I decided that one article just couldn't do it the justice it deserves. So I'll probably dribble it out in several articles specific to a particular topic.

In this article, I thought I'd explain why I went to the World Space Modeling Championships as a supporter of Team USA, and what I got from the experience. That is a



**Members of Team USA at the opening ceremony.**

little bit more complicated, because it gets to the heart of why I'm in the model rocketry business, and why I even fly rockets at all.

I should mention that I wasn't a contestant on the trip. My two daughters were on the Juniors team, so I attended as their chaperone. Officially, I was labeled as a team supporter. The duties of a supporter are to help others with rocket recovery. But since I have a little bit of expertise in rocketry, I also assisted with repairing damaged models.

I was reading a message this morning from a team member, who was explaining what he gets out of competition rocketry. He wrote: "I do this type of flying as much for the camaraderie of being part of this team and sharing the



**To save precious seconds, prepping of the models is accomplished right next to the launch pad.**

challenges of traveling and operating with you overseas in a high-pressure task as I do for the personal skill challenge that FAI flying offers."

In a lot of ways, I agree with this comment.

But to be honest, since I'm more introverted than other team members, it was a very physically demanding adven-



**Concentration and a second pair of eyes from a teammate help during the intense competition.**

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## World Space Modeling Championship



***A young contestant from the Czech Republic waits his turn in the rocket check-in line.***

ture. The reason is that one aspect of introversion is about "energy." Extroverts are energized by being around others. Introverts, like me, like some quiet time to get recharged. Just like Superman, I need a fortress of solitude to get my



***The chow line is where everyone got a chance to mingle and have lunch together.***

head straight. So being around so many other people for long periods of time took a lot out of me. We were out on the range from sun-up to well after sun-down. Because of this, there was never enough quiet time for my liking.

Don't get me wrong, I like rocket people, because I especially love to talk shop (rockets). And the people on the US team are on the cutting edge of rocketry and have a lot of information to share. While it wasn't the best part of the trip, it was a fantastic aspect of it. I enjoy just sitting and watching people prepping their rockets, either in the hotel room or on the field. You can glean lots of little tidbits of in-



***Waiting for the gyrocopter to come down, but hoping it hangs in the air just a little longer.***

formation from them. For instance, you learn a lot about the team members and the challenges that they are working on. Most of the time, they are working on solving rocketry issues that I wasn't aware of yet.

Additionally, what makes competition rocketry unique is overcoming challenges that pop up during the event. Inter-

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## World Space Modeling Championship



*The day after winning two Gold medals, Antonio Mazzaracchio of Italy takes a rest in his tent. Antonio is a one-man team, so he chases his own duration models. By lunch time, his GPS tracker confirmed that he had already run over 20 kilometers.*

national competition is even more intense, because you're so far away from your home base. You have to become "MacGyver" and use the few resources you have at your disposal to pull off a miracle.

For example, on the day of the scale model flights, my daughter's Saturn 1B went unstable and crashed pretty hard. The reason the rocket went unstable was that the winds were pushing 15-20 mph on the morning of the

launch. As soon as the rocket cleared the launch rod, the wind threw it on its back. This didn't just happen to her model. It was rare to see a flight that day that didn't get pushed around by the wind. The wreckage on the field was devastating.

But the team members picked up the pieces, and six guys pitched in to help her repair the rocket for a second flight. And it was a very complicated repair project. Not only did the model have to be reassembled, but major engineering changes had to be made internally. The rocket used



*Long days were common at the contest. The medals were often awarded by car headlights.*

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## World Space Modeling Championship



**Allison Van Milligan holds her Saturn 1B.**

rear ejection on the first stage, and all the shock cords (which were anchored deep in the bowels of the rocket) got yanked out. It would have been impossible to reattach them without tearing apart the rocket completely. So putting our minds together, we had to find an alternate way of attaching them. But we needed more Kevlar® shock cord, and you can't get that in the middle of a field in Bulgaria.

So the call went out in the tent for more shock cord. And sure enough, some other flyer had some available. That was the really neat thing about being on a team. Everyone is willing to share the resources they had with them. I can say that there is even sharing between countries. I



**All eight engines are burning, but the wind catches it just as it clears the launch rod.**

had to borrow a soldering iron to repair a launch system, and the only one on the field was in the tent of the Bulgarians. And they were very willing to help out.

The repair to the Saturn 1B involved routing a harness of four shocks cord through the engine mount of the central motors. It wasn't pretty, and if there was a different way to

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## World Space Modeling Championship



**Allison was all smiles after the rocket was repaired. Here you can see the silver tape on the top of the rocket to hold it back together.**

do it, I probably would have recommended it. But there wasn't time to do it "the best way." There was only time to get something workable.

The launch of the rocket after the repairs was successful. All eight motors in the first stage lit, and it took off straight, even in the howling winds. Two seconds later, the second stage fired as the booster dropped away under parachute. When the final parachute came out a few seconds later, a loud cheer went up from the entire team, and my daughter was surrounded and hugged by her teammates.

The rocket didn't win a medal. But it was a successful flight, and that is what mattered to the team. Why? Because they all had invested in the rocket during the repairs,



**No, she didn't win... They're just celebrating a successful launch and recovery after an initial failure.**

and to experience everything working as they hoped, was a major accomplishment.

I have a hunch that you'll probably agree with this next statement. We don't really recall the flights that worked like a charm. The ones we remember and are most fond of are those that required extra effort to eek out a "qualified" flight. The icing on the cake is when we get other people involved in overcoming the obstacle, and we share the experience. We now have a story that is tied to people around us.

That gets me to why I love this hobby, and why I'm in business here at Apogee. The thing about rocketry is that it comes with built-in challenges. Rocketry is complex. After

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## World Space Modeling Championship

all, it is "rocket science." And I enjoy the thrill you experience when overcoming a technical challenge. That proves mastery over our surroundings, which is a core drive of scientific exploration (see Peak-of-Flight Newsletter 85 at [www.ApogeeRockets.com/Education/Downloads/Newsletter85.pdf](http://www.ApogeeRockets.com/Education/Downloads/Newsletter85.pdf)).

Most of the time, the challenges we're trying to overcome are those of "consistency." We're constantly fighting against Murphy's law. Things that can possibly go wrong — do. It doesn't matter if it is a competition flight, or a Level 1 high-power certification launch. We're not competing against other people, we're being challenged by the physical laws of nature. Overcoming our own shortcomings and getting another successful flight is what the excitement of rocketry is all about. In a sense, each successful launch is a measuring stick; it lets us gauge our own growth. But if it wasn't for the challenges, there would be no marks on the ruler, and hence no way to tell if we're actually progressing.

Everyone in rocketry has their own war stories, as we've all fought against the laws of gravity and aerodynamics. Sharing the solutions to those challenges is what brings us together. That is the reason I put out this newsletter.



*A beautiful scale model of a Russian Proton rocket gathers a lot of attention.*

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## World Space Modeling Championship



***The American and Russian teams had a blast together after the contest was all over.***

From my perspective, it documents the solutions to the common problems we've all faced in rocketry. I constantly refer modelers back to the archives, because there is a lot of valuable information there.

Obviously, I don't write all the articles in this newsletter myself. I seek out others that have come up with neat ideas that I can disseminate to 22,000+ readers of this newsletter. And if you have a new technique you'd like to share, please feel free to write me about it. I'm always on the lookout for articles for this newsletter. But I feel especially lucky that I get to be the middle man in the transfer of solutions.

### ***Another Reason I Attended the World Space Modeling Championships***

Since I'm being honest about my reasons for attending the WSMC, I'll tell you my selfish reason. It is about being a father, and wanting a great future for my kids.

The unique thing about model rocketry is that it really

does open up doors to a stellar future. Why? Because the average non-rocketry person is very impressed by those students that participate in rocketry. And that is something I'm betting on as their father. If my kids are involved in rocketry, I anticipate that they will get preferential treatment in school. So far, this has been the case. And when the time comes for some college admissions bureaucrat to decide whether or not my kids are selected for a scholarship, I'm counting on the deciding factor to be "participation in rocketry."

By encouraging my kids to get on Team USA, I believe that I'm giving them a leg-up for their future. Whether they win the competition isn't important. And I don't push them to win; just to do the work and to do their best. Because in the end, just being a participant in rocketry is really enough to sway non-rocketry bureaucrats. After all, how many other



***The flip-out fins used on Allison's Saturn 1B rocket. They were based on the fins in Peak-of-Flight Newsletter #313 ([www.ApogeeRockets.com/Education/Downloads/Newsletter313.pdf](http://www.ApogeeRockets.com/Education/Downloads/Newsletter313.pdf))***

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## World Space Modeling Championship

kids can say they built and launched -- in Bulgaria -- a 1/70th scale replica of a Saturn 1B rocket that had 10 engines in it (8 engines in the first stage, and one in each of the second and third stages)? Heck... even I'm impressed by a kid that does that.

In conclusion, let me say that attending the World Space Modeling Championship was a unique experience. While it was physically demanding, it generated so many good memories that I'll never forget it. I can see why so many of the team members look forward to the next trip. If you are interested in competing or having your kids participate, a good place to start learning about international competition is at the NAR's web site: <http://www.nar.org/contest-flying/fai-spacemodeling/>. The try-outs, where the next team will be selected, will be held next summer at NARAM-57 in Arizona.

### 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.



**Bill Stine and Ellis Langford run from the launch of a nearby rocket.**

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