



Bill Stine and James Duffy prepare Duffy's Little Joe I model for flight. Opposite page: The entire United States team poses for a photo.

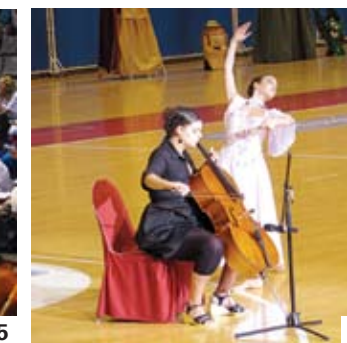


WORLD CLASS

Spain played host as the 17th FAI World Spacemodeling Championships brought together model rocketeers from 19 countries to test their skills. BY GEORGE GASSAWAY



View from the flying field showing the Santes Creus monastery surrounded by the city of Lleida. The monastery dates back over 800 years, to the year 1158. Below: 1) Each country's tested motors were locked in impound boxes; 2) Kevin Kuczek practices flying with Nick Riviuccio as his spotter; 3) Kevin Kuczek prepares to fly his S8E-P model; 4) Team Manager John Langford watches as Greg Stewart makes an S8E-P practice flight; 5) The teams during the opening ceremonies; 6) A ballet dancer and cello player during the ceremonies; 7) A Lithuanian model box with several 40 mm type models inside.



This past August, while the world was watching the final week of the 2008 Summer Olympic Games in Beijing, China, another international competition was underway in Lleida, Spain. The World Space Modeling Championships (WSMC) brought together representatives from 19 countries to compete in what has been called the Olympics of Model Rocketry. And like the Olympic Games, medals in gold, silver, and bronze were awarded in individual and team events at the WSMC.

The United States was well represented, with 11 senior team members, 10 junior team members and two managers—John Langford for the senior group and Bill Stine for the juniors. National Association of Rocketry leaders and family members were also there for support.

Most of the team members flew into Barcelona a few days early, arriving August 20th. This allowed for any travel delays, and gave us all time to adjust, and to do some sightseeing as well. Two days later, on August 22, the U.S. team boarded a couple of chartered buses for the two-hour drive to Lleida. Upon arrival, the first order of business was to submit our rocket engines for static test firing to make sure they were within the Newton-second limits.

Saturday, August 23rd was a practice day. For the first time we went out to the flying site, to see what it was like and to test-fly models. The site was a small civilian airport with dirt runways. It was a very large site, a great place for holding a WSMC. Those who flew the S8 (R/C Rocket Glide) event put in many practice flights, to settle out R/C frequency issues and get in some practice boosts since the next time their models would fly would be during the contest. That evening, the opening ceremonies were held, at an indoor stadium in downtown Lleida. Each team came in one by one, Olympics style, with their country's flag. After the typical speeches there were varied types of entertainment, such as folk dancers and a ballet dancer dancing to the music of a solo cellist. The ceremonies concluded outside, with a small special fireworks show.

DAY ONE: THE COMPETITION

The next day, August 24, the competition began. But first, some background on the contest rules, which play a major role in how the models are designed, constructed, and flown:

The S3 (parachute), S6 (streamer), and S9 (helicopter) models have to be a minimum diameter of 40 mm (1.58 inches) for at least 50 percent of the body length, with a minimum length of 500 mm (19.69 inches). Such models are almost equal in size to the Estes Industries iconic "Big Bertha" model rocket. Yet they are far lighter and thanks to tapered tail cones they have much lower drag than a Bertha. The bodies are often fabricated using the bare minimum amount of 1/2-ounce fiberglass necessary to hold up for flight and be pressurized for ejection. A 40 mm body tube without fins can be made with 5 grams or less, and the nose cones (often vacuum-formed) weigh about a gram or so. For most of the contest events, the engine class is "A" power. This is why so much care goes into building light models, as the power is so limited.

For the Free Flight (non-radio controlled) Duration events, there are several very notable factors for flying. The events have a "max" time, which is three minutes for most of the A-powered events, and five minutes for S3A (parachute). If for example the glider model flies for three minutes or more then the timers stop and you get a max score of three minutes. There are three rounds of flying, with the scores added together. Often in the events, there will be several competitors tied for first with three max scores, so they go into a flyoff to break the tie, with the max time increased.

Another matter is trying to pick thermals, or rising air, to make the model stay up longer. On the U.S. team there are a few people who are excellent at picking thermals, so they study the conditions to try to determine when a thermal seems to be coming by and radio to the U.S. team pad area when to launch. But that is only half the battle, because all of the other teams are also doing the same, and there can be minutes going by with no flying at all, waiting for a thermal, and then a traffic jam of fliers wanting to fly at the same time. Consequently, there can be quite a long delay between detecting the thermal and actually having a model launched. Sometimes, the delay is so long the thermal goes by and the flier waves off, hoping for the next good thermal to come by soon. But they cannot just wait and wait. Usually, the flying rounds are 90 minutes long, for all three team members to fly. So, on average, an individual team member only has about a 30-minute window to fly.

A final flying issue is that there are two models allowed for the first three rounds. One of those two models has to be returned in order to be able to make a third flight. That requirement to get back one of the models brings forth the need for an organized recovery crew. Fortunately the U.S. team has one of the best, if not the best, recovery crews. The recovery crew is made up not only of team members who are not flying the event, but also others from the U.S. contingent such as family members. Everyone has long range FRS radios and binoculars, and are stationed at different distances out, sometimes one to two miles away. In the course of chasing down an individual model, the chase might go on for several miles. For this year's contest in Lleida, the terrain was favorable for chasing. There were no forests, though there were some orchards that came into play on a few occasions depending on wind direction. The U.S. recovery crew brought back almost every model, and every U.S. flier had a model returned in time to make their third flight.

For the first day of the contest, the two events were S9A (helicopter) and S6A (Streamer). For the morning, the Seniors flew S9A, while the Juniors flew S6A, then the events swapped for the afternoon. The weather was good, clear skies, not too windy, with lots of thermals. It turned out that the weather would be good like that for nearly the whole contest.

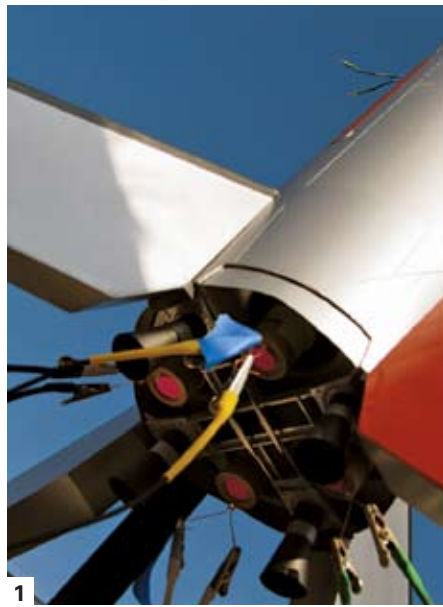
The competition was tough, a lot tougher than the level I saw the last time I went to a WSMC in 2002. It was great to see the way the U.S. junior team worked together and flew together all week. The senior S6A team members were Tony Reynolds, Pat Butler, and John Hochheimer. The junior team members were George Reynolds, Esther Clark, and Colin Harris. The 40 mm models typically used 6 x 60-inch streamers made of 3/4 mm to 1 mm Mylar. The U.S. models seemed to be outboosted by a lot of other teams' models. On top of that, we often picked good thermals ... but a queue of other fliers wanting to fly often took so long to launch that by the time one of our team wanted to fly, the thermal went past and they waved off. Tony Reynolds had the best score on the senior team, and George Reynolds had the top score of the U.S. juniors.

The senior team flew S9A Copter in the morning. The team members were Trip Barber (NAR president), Keith Vinyard, and myself. Trip Barber had a solid first flight of 1:47, no thermal as he flew first in the round at about 9 a.m. Keith Vinyard had a very good first flight, at 2:41, in some lift. We agreed that Keith probably had the best dead-air model of any of us. My model (flop-rotor) seemed to have missed a thermal at first, but found some decent lift the last half of the flight to stretch it to 2:30. Second round, Trip Barber got a good thermal and maxed (model flew for three minutes).



1) U.S. junior team leader Bill Stine with Katherine Humphrey; 2) Check-in of S8E-P R/C rocket gliders; 3) Nick Riviuccio launches his S3A parachute model; 4) Czech team member Barbara Pakostova's model during glide; 5) Kevin Kuczek and Greg Stewart during the rocket glider event; 6) Barbara Pakostova during the competition; 7) S9A copter senior medalists Krzysztof Przybytek of Poland, Maksim Timofejev of Lithuania, and George Gassaway of the U.S.; 8) Esther Clark preps her streamer model.

This page: 1) Tents at the sprawling launch area; 2) Esther Clark tosses a football during a lunch break; 3) U.S. team manager John Langford with models just returned from the flying field; 4) George Gassaway's S9A copter model ready for launch; 5) FAI medals and trophies; 6) Tony Reynolds and John Hochheimer with Pat Butler's S6A streamer model on the pad.



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This page: 1) The nozzle section of James Duffy's Little Joe I model, powered by a cluster of four C6 motors in the booster and a single A motor for the capsule; 2) The detail on the Little Joe I; 3) Duffy preps the model; 4) The Little Joe I lifts off; 5) Recovery of the model; 6) A silver medal winning Ariane 3 model, made by Wojcieck Krzyniowski (at right in photo) of Poland; 7) A Russian team Ariane model in flight. Opposite page: 8) NAR President Trip Barber checks in his boost glide model; 9) S3A parachute senior medalists Sergey Sergey Kappushov of Russia, Zhang Li of China, and Alexey Reshetnikov of Russia. 10) Ian Dowsett of Great Britain and Trip Barber of the U.S. at the banquet. 11) S8E-P medalists George Gassaway of the U.S., Peter Matuska of Slovakia, and Alexandrs Ojavers of Latvia; 12) The Russian junior and senior teams were the overall champions; 13) the U.S. S8E-P team of Greg Stewart, George Gassaway, and Kevin Kuczek, with Lleida in the background.



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Keith's model flew in some down air, and only got 95 seconds. I flew into a big thermal and maxed easily. During round three, Trip's model had one of those "why now?" moments that even the best flier has had on occasion, when somehow the hollow nose cone assembly hung up the rotor blades to keep them from deploying. Keith had a nice flight of 2:18. For my last flight, with help from Trip and others spotting lift, we made it first into the queue to launch, and the model caught a decent thermal to make it max. So, I had a pretty good score, but was it enough to medal?

The results were not known for some time, but finally the word came in, that I had won the bronze medal. I had the third best score. It was quite a feeling to win another FAI medal. I had won the bronze in 1987 and 1996, both in S8E (E R/C Rocket Glide). I had wondered if I would ever win another FAI medal. Also, this had been an up-and-down year for me personally, so I had a greater appreciation for winning this one.

The junior team flew S9A (helicopter) in the afternoon, when the thermals were going strong. The U.S. junior team members were Magda Moses, Colin Harris, and Katherine Humphrey. The S9A copter event is one of the hardest to make a qualified flight due to the complexity and stresses at ejection, but all of their flights were reliable and put in solid scores. Magda Moses caught two good thermals for her last two flights, one of them maxing. However, a lot of the other junior fliers did even better, so she only ended up in 11th place.

DAY TWO

On Monday, August 25, the senior team flew the S3A (parachute) event in the morning, with a five-minute max time. Members Mike Rangitsch, Jennifer Ash-Poole, and Nick Rivieccio flew 40 mm models using 36- to 40-inch-diameter parachutes made of 1/4 mm Mylar. Historically, S3A is perhaps the most unforgiving space modeling event since any failure to max effectively takes one out of medal contention. Flown in Spain in the morning, round one didn't have a lot of thermals. Jennifer achieved the sole U.S. max in round one. This led to high hopes, but Mike posted the only other U.S. S3A max in round three. Nine S3A fliers maxed out. After two flyoffs, Zhang Li of China won the individual gold medal, and Poland took the team gold.

In the afternoon, the U.S. junior team of Ben Reynolds, Katherine Humphrey, and Philip Rangitsch flew their models. Ben and Katherine both had maxed their first two flights, but Katherine's third flight did not deploy, and Ben's third flight only flew for 115 seconds. The Spanish team's familiarity with the Lleida site, and its thermal experience, paid off, as three of their juniors were among the 10 fliers who maxed out to make the flyoffs, and the Spanish team took gold. Spanish juniors Jesus Moran took the gold, and Francisco Palomar took the silver, with Gao Pen of China taking the bronze.

In the morning, the U.S. juniors flew S8D, R/C rocket glide. It is scored as the other duration events, with a max time of 6 minutes. The models typically use low-thrust, long-burn engines, and need to be radio controlled during the boost portion to keep pointing up. All of the U.S. junior fliers did well, thanks to their own dedication and practice and also to junior coach Greg Stewart. Mike Humphrey put in solid scores, his last being a six-minute max. Craig Vinyard flew well, especially his first two flights, while his last got caught in some down air, up in 7th place overall. Matthew Berk had the contest's biggest heartbreak. His first flight was a max (quite notable for a first round morning flight), and a good second flight.

(Continued on Page 78)

In preparing for his third flight, there was some confusion when his model was launched. He flew to a max, only to find out that his flight had been disqualified because a team member launched his model too early, before the official countdown. Somehow two other countries launched at the same time, which never happens, so there was some contributing confusion caused by the range safety officer (RSO) in some manner. But, there was no way of overturning this or getting a re-flight. It cost Matthew a silver or bronze medal, and cost the junior team a silver medal. The team ended up in fourth place, 40 seconds back from Poland's bronze. The gold went to Russia and the silver to China. Individually, Gou Zhaofeng and Li Zhouheng of China took the gold and silver medals, while Jan Chmelik of the Czech Republic took the bronze medal.

In the afternoon, the seniors flew the S8E-P event, which is a unique type of R/C rocket glide, flown on E power (U.S. Team members used E6s by AeroTech and Apogee). There is a target time of six minutes. Each second over or under six minutes is a point off, the perfect time score is 360. There is also the runway landing, on a 50-meter line: If you land within 1/2 meter, 100 points; between 1/2 meter and 1 meter, 50 points; from 1 meter to 5 meters, 25 points. This makes for some very hairy landings at times, sometimes even crash landings. Most S8E-P models have some form of glide path control, such as a flap, spoiler, or airbrakes. The flights are done in flight groups with six or seven people, randomly selected, all flying in the same 12-minute window. For this WSMC, there were six flight groups. Whoever has the best raw score for their group, the score is normalized to 1,000 points, and everyone else in that flight group has their raw score adjusted accordingly. So, this takes into account the fact that the weather (thermals or wind) may be bad when one flight group flies, but good when another group flies. That came into play quite interestingly later on. For the U.S. team, we help each other to fly, so when one pilot was flying, another pilot was the main spotter. Also, Nick Rivieccio was a main spotter and helper for all of our flights including keeping track of the 12-minute flight group time and synchronizing a talking countdown clock to the time of the official timer's watches. Very experienced R/C flier and 2006 S8E-P member Keith Vinyard also assisted.

I was the first U.S. team member to fly round one, in flight group two. I managed to find some good lift to make the six minutes. The model hit another thermal on my landing downwind leg, which led to it landing 12 seconds over. This was a 50-point landing, with the model just over half a meter from the runway tape. The next team member was Kevin Kuczek. He had a good boost, and found lift. His model got pretty high and he lost orientation with it, which let the model get far downwind. He ended up about 45 seconds or so over on time, with no landing score, but some other countries had some problems (crashes and disqualified boosts), so we still had a shot at a good team score. Greg Stewart was the third team member to fly. His boost was good, and he got plenty of lift. Greg nailed his landing, with a six-minute time score, and 100-point landing, for a normalized 1,000-point score.

Due to poor scheduling, only one round of S8E-P was flown Monday, the rest of it was continued on the afternoon of the next day.

DAY THREE

On Tuesday, August 26, the senior team flew S4A (boost glide) in the morning. It was a bad day. Trip Barber's first to flights were disqualified for not boosting close enough to vertical. We had never seen these types of non-vertical boost calls in boost glide before, but a recent rule change opened

the door for doing so (needlessly in my opinion). The other team members, Keith Vinyard, and John Hochheimer also had problems with more bad boost DQs and so forth. The winning models were all special. Jozef Jasso of Slovakia took the bronze with a scissor-flop wing type model. Nigel Bathe of Great Britain took silver, flying an incredible new design by Mike Frances, a scissor-wing that folds its chord into a triangular cross section (as seen from the nose), for what almost looks like a regular rocket going up. The winner was Gabriel Constantinescu of Romania, flying a very special folding-wing design that folded the chord in half, then the span in half, to be boosted inside of a 40 mm type of rocket.

The U.S. junior team of Matthew Berk, Craig Vinyard, and Ben Reynolds fared better than the U.S. seniors, for a while. Matthew and Ben both had three-minute maxes for their first flights, but then the gremlins struck to take them out of contention.

Normally, S7 (scale) is held at a WSMC, but due to a new limit of five official events at any WSMC, it was not held officially for FAI WSMC medals. Instead, S7 was held as an FAI World Cup event. There were not as many entries as would normally be seen in S7 at a WSMC. James Duffy built and flew an excellent large model of a Little Joe I. It was powered by a cluster of four C6 engines, plus a 1/2A in the base of the Mercury capsule to get extra points for simulating an "abort." It flew very nicely. Unfortunately it did not have the extra details and special flight tricks that several of the other models had. The gold went to Bedrich Pavko of the Czech Republic, silver to Wojcieck Krynienski of Poland, and bronze to Vladimir Tarasov of Russia, all flying various versions of the Ariane rocket.

Finally, the completion of S8E-P in the afternoon, for rounds two and three. Greg Stewart had a perfect six-minute time, but just missed the landing zone, which hurt his score. I flew next, managed to find enough lift (with Greg's coaching) to make the six minutes, landing at 6:02 and a 100-point landing. That was the top raw score in my flight group so I got a 1,000 normalized point score. Kevin Kuczek flew well, for a 100-point landing and being just one second off. He too was top in his group and got 1,000 points. So, team-wise, we had some hope of getting a medal.

In round three, things changed dramatically. Sometime in flight group two (or before group two started) the wind shifted 90 degrees and blew tremendously strong. When it first kicked in, there were gusts over 30 mph. It dropped a bit to an average of about 20 mph, but it was 25 mph at times. This made it a lot harder to launch, but I do not think there were any crashes, and I think only two DQs for non-vertical boost.

With the winds so high, our team's number one priority was to get a safe qualified boost, then do what we could once up safely. The models Greg and Kevin had were optimized for lower winds. Greg was up first (in group four). He had a great boost. His model needed a lot of down elevator to try to penetrate into the wind. This cut into his duration time a lot, to the point he landed at 2:37 and was fortunate to make 25 points in the landing area. Only one person would score a 100-point landing in those round three winds, the landing scores were scattered between 25 and zero landing points, other than one 50-point landing. Kevin had a great boost in the wind, and settled into a good glide. But like Greg, he had to give a lot of down elevator to penetrate into the wind, and landed at 2:38, not getting a landing score.

On seeing how much potential time was lost in trying to penetrate the models into the wind, with a very low chance of getting a good landing score, I started to think of a different strategy. Ignore the landing part entirely, and let the model fly away. In discussing this strategy with the team, we decided to go with it, and after boost, just steer the model to point into the wind. Just let it fly at its best glide, and it would slowly drift backwards

downwind. The R/C model might be lost, but it would be worth it for a possible team medal.

Shortly before launch, a quickly assembled recovery crew went downwind to try to find it. Despite the wind, the boost went off great, and the model was settled into a steady glide into the wind. It drifted farther and farther away—ultimately, so far it was too hard to see to keep it under control so it flew on its own the rest of the way. Fortunately, the timers were using binoculars so they saw it, for a time of 5:42. This easily won the group, the second best score by any other flier in my group was 4:13 and a 25-point landing.

As it turned out, my 1,000 points for round three was not enough for a team medal, we finished fifth. But it was enough to move me from eighth place to fifth place. That was very important because in S8E-P, the top five fliers go into a flyoff round. The previous three-round scores are kept, and not zeroed, so I went into the flyoff in fifth place, hoping to maybe move up to a bronze medal.

Shortly before I flew, the recovery crew radioed in that they had found my first model, a testament to their skills as it went down 3/4 mile into an orchard (thanks go to Steve Humphrey who led the crew and Matthew Berk who found it, plus everyone else). I flew my backup model, and it boosted fine. However it was nearly dark by then, I lost sight of the last part of the boost and rolled it the rest of the way. Got it in sight once it went into glide, and with spotting help from Greg Stewart and Kevin Johnson, was able to fly it fine. The winds were not as strong as they had been before, and the direction shifted to a clear area on the field, so the model landed about 1,000 feet away and was easily found.

Once the flying had ended, we really did not know any results, and due to it being long after sunset we had to hurriedly pack up and get to the buses. It was during the long walk back to the buses that Colin Harris congratulated me on winning the silver medal. What? I had hoped to maybe move up to get a bronze medal, but the drift downwind strategy had paid off to climb to second to take the silver. My time of 5:26 was the top time, but Peter Matuska of Slovakia managed to get 5:20 plus a 25-point landing, so he won the flight group, and also nailed down the gold medal with a perfect score of 4,000 points (he won every flight group he flew). Very impressive flying by Peter. Two other fliers of the group got 100-point landings, but they had sacrificed too much potential duration (with times of 2:49 and 2:30) for the 100-point landings to pay off versus using the drift strategy. Alexandrs Ojavers of Latvia took the bronze medal, he had moved from 4th at the end of three rounds to third. And that is how the WSMC flying ended.

FINAL THOUGHTS

When we all began the trip to Spain, we had hopes of many medals for several team members and for the teams flying the events. But you do not ever go to a WSMC expecting medals, as more likely than not you will be disappointed. The level of competition is so high, and so many things have to go right, that one is fortunate to even be in a position to win a medal. I was on this trip in large part to write about it for LAUNCH Magazine, hoping I would be writing of medals won by other team members, and probably not myself (though we had such high hopes for an S8E-P team medal). As it turned out, I was the only one on the U.S. team to get a medal this time, and it was for both a bronze and a silver win. +

Author's note: I would like to thank NAR president Trip Barber, LAUNCH Magazine Publisher and Editor Mark Mayfield, and U.S. team manager John Langford. Each in his own way played roles that made it possible for me to be able to attend the WSMC this year. And I would like to thank the whole U.S. group. Almost every one of them provided assistance in one way or another.



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