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Interview with Casey Hatch

Casey Hatch

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Interview with Casey Hatch
April 9, 2011
Riverwoods Conference Center, Logan, UT.

Name: Casey Hatch

Date of Birth: January 2, 1970

Place of Birth: Chesterfield, Idaho

Interviewed by: Landon Hillyard

Question: Where are you from?

I went to school here in Logan. Most upbringing on a farm. I live here in Logan. I graduate from Logan High School in 1988. I went on a mission and then found out about the GAS Program from Kristen Redd who Jan had hired to work on the bubble experiment. So I came to see her after my mission and in talking to her found out about the GAS Program and pretty quickly asked if I could get involved.

Question: What made you interested in space?

Part of it was the constraints. I think it's kind of cool when it's not a open end book you have to do certain things in a certain order and you can't build out of certain things. You have to use Teflon wire, you have to build out of aluminum because steel's too heavy. So you put all these constraints together and it made it really intriguing.

You like the constraints?

Yea it's awesome because it makes you think. From my point of view the GAS Program was awesome because you're thinking. You had a problem presented to you and you have to figure it out. The professors weren't telling you how to do it, you were doing it. That is awesome. I loved it. The constraints to me were a feature and I think they were a feature to a lot of people. Some people don't like constraints at all, but I'm the opposite. I think constraints are awesome. You have to come up with more clever solutions and that is just fun.

Question: Give me an example of how that applies to the GAS team.

My first responsibility I did the technical and mechanical structure on G254. I was involved in putting all that together. I did the battery box on G254 and you were constrained on what type of wire to use. We were using ? gage to flag terminals so we had to design a way to put all those together and get the most energy in that compact footprint. So you had multiple constraints. 1. How am I going to hold the batteries in place? It wasn't an easy solution. We had to do the shake table and we had to use different sizes of batteries. Otherwise you just put a bolt and washer, but you couldn't do that when you had two different cells. Then you have to try to get as many cells in there as possible. By doing different arrangements you could get one or two more cells by wiring. So stuff like that. Look at this, look at what I figured out. Then you would forget about it and start building it up and so you had these constraints like that. Mechanical constraints, electrical constraints, using the space pack instead of the isogrid. We flew an isogrid structure on there.

What is an isogrid?

That's the isometric triangle structure. So like the current, I call it the reasonable payload support system. That's my acronym. Clint and I designed the one that flew on G90, G200 and G220.

Oh that triangle that was inside the GAS can?

Yeah, so you knew you had mounting points and you could design something that fit all in. You could reuse that same structure, you just put a different interface plate on. So the isogrid we kind of thought the space pack, the foam and fiberglass was old fashioned, but at the same time it was really nice. It worked well, it was light. It was pretty nice because each student had their own quanta of space. The space pack has to fit in here and if it does it can fly; if it doesn't, it doesn't fly. There's one of those new constraints. When I came in the program in '91 nothing had flown since pre-Challenger so we had to retrofit it to the current standards. It used to be that each space pack had it's own battery, but now we had to have common battery. So we had to do a new wiring system and fuse everything together and it made it much more complicated because before each student had a quanta of space. Well now you have to jump that with wires. So it was a challenge to make that work especially since no one had flown since '85 or whatever. Well it was '86, it was just before Challenger that the last USU payload flew. So that was a space of 8 years between flights. So I was involved in the early stages of getting the program going again. That was just a hoot.

So you were the first one in it?

Well, I wasn't the first one in it, friends like Kristen and whatnot and then I met people like Matt Droter who some of the best and most fun experiences of my life in college were building payloads two weeks before shipment. Matt and I in the machine shop twenty-four hours a day just going like crazy, listening to Ministry and Skinny Puppy and talking politics and ethics and machining payloads for the Shuttle. It was awesome.

You know the bomb box thing, the batteries?

The grey one? I helped design and I built that one. Our initial isogrid structure for this RPSS system that they talked about we had a section of the hexagon for the battery box but we didn't know what we were doing and we designed it wrong so it wouldn't work. It wouldn't seal. So we flew it on G200 but we realized we had to redo this. So we came up with a simple design, that cylindrical system. In talking with Reed Neilson in the Technology Department he taught us how to design and build it so he could weld it properly as a pressure vessel. So because of his input Clint and I designed that system so that when he welded it it would be full penetration welds, it would be to spec. He taught us a lot of the skills necessary for like for o-rings, how to design the channels so the gas would actually seal in the o-ring rather than leak through and stuff like that. So he taught us a lot of those tricks and then they let us use the machine shop in the Technology Building because we needed one to turn that big piece of metal. Then I turned it down and got everything stacked and Reed welded it for us. All the welding that the GAS program did we had Reed do because he did all of SDL's stuff and he knew what he was doing. He did beautiful work and you know it right. It's not a student going yea I think it's good.

Question: I've heard a lot of talk about students going down to the Cape. Can you talk about your experiences?

My first trip I got to go to integration for G254 so it was Gil, Ragu Tunkur, who was the GASS coordinator, Dan Tebbs and I. Gil is fun to travel with. So we go places and everywhere

we went people would see Gil from probably 50 to 100 meters away and yell “Gil” and he would turn around and say “Jerry”, Frank or whoever. We got to meet two of our astronauts on our flight because we walked into the Headquarters Building and somebody recognized him, clear down the hall, and he’s like hey you’re astronauts, what flight are you on? Oh, two of your astronauts are coming in tomorrow, do you want to meet them? Of course we do. So Mark Lee signed this document for us. At one time he had the record for space walk duration and then the other astronaut we met, Susan Helms, currently had the longest space walk. So it was cool. So we got to meet them and then we got to go meet Anchor Rasmussen, whose is in Hanger AF, that where Thiokol at the time recovered the boosters. So because we are with Gil we go to talk to Anchor and he takes us through the Liberty Star and Freedom Star and we get to see the whole freaking operation from the recovery side of things. One of the best, we’re out there looking at the Manatees in the Banana River and Gil is looking at the Manatees and saying what made those sailors think these were mermaids? Anchor Rasmussen says, without missing a beat, the rum! Oh his parents hated him to be on the ocean with that name “Anchor”. Then we met Russ Griffin whose the small payload manager, Hitchhiker, GAS, those kinds of payloads, he was the manager of that. He introduced us to Russ and because RUSS was a NASA employee he got us in BAB took us up to the 34th floor. We look down and there was a shuttle down there, 12 stories below us, mounted to the stack and everything. That’s the first time height has ever affected me. Because we were inside of the building, 450 feet down. So the church office building would fit inside it and you’re inside it looking down. It was just neat. We got to go behind closed doors to meet people because Gil knows people, but not just that, people love Gil. He got us an interview, we got to meet Bob Trippet, Kennedy Space Center director at the time because Gil’s friend Hugh who used to be the announcer on the Apollo Program said hey you want to meet Bob? Sure we want to meet Bob. All these experiences at integration.

Then there’s temper twos?. Temper twos needs to be talked about. I won’t mention names. Temper twos happen when there’s miscommunication between members. One of our guys was convinced that NASA wouldn’t let us take our soldering iron on the base and he was so convinced of it that nothing would change his mind. He would not leave the motel, he wouldn’t. We were like come on let’s go and he just said no, they won’t let us on base. Yes, they will. No they won’t and he wouldn’t leave. So Gil and I take off and we go to base and do what we can do without the electrical side of things. We get done by noon and Gil says let’s go see a movie. He takes me to a IMAX movie. I thought Gil is a good guy, he takes me to one that he’s in. I think it’s Blue Planet and you watch the bottom right hand side of the screen and you see Gil all excited watching the shuttle launch. I just laugh, oh Gil that’s a hoot. That’s when I asked, it was that time when he and I were together, I asked him about his eye, because there’s all sorts of stories about how he lost his eye. I said if you don’t mind I’m going to ask you this and he’s like what do you mean? Well, there’s all these stories about your eye. What are you talking about? What kinds of stories? I’ve heard you lost it in a B2 accident, a chemical accident, I heard you lost it in a high power rocket accident. He said no, when I was two years old the screen door with a piece of wire sticking out of it poked me in the eye. It was funny. Who is saying these things? I’m just saying, Gil, I’ve heard these stories. It was because we had time together alone that I was able to ask him that. He’s an approachable guy, he doesn’t get ticked off if you ask questions. He encourages questions. That’s what’s awesome. Gil really didn’t do our experiments. He was kind of almost like a cheerleader of sorts where he encouraged people. He would be excited about it, but he didn’t tell you what to do, he let you do it.

Then we drive down to the Cape. Then Gil, Matt, and Ragu was in one mini-van, the Red Corpuscle, because it was red and Mark and Mike Wilkinson and I were in the Blue Goose, the blue mini-van. We drive down to Florida and we're going to camp to save money. This is September. From the time we left Salt Lake until we got to Jetty Park in Florida was 44.5 hours. We just straight shot it through. When we get down there it was so freaking hot that Mike and I couldn't sleep. Some of the things I remember from that night was looking at Matt and Mark asleep in the tent with just pure loathing hatred because they could sleep and we couldn't. It was just too freaking hot. I woke up the next morning with my shirt off and one shoe on spread eagle on my mattress. I was just glad I was in my tent because I have no recollection, we were about a quarter mile away from our tent where I last have memory. It was just pure exhaustion when we finally passed out. That morning, that day was when the launch happened. The stories that Jan was talking about being scared, I'm a witness to that. Jan was petrified, he was scared to death, I've never imagined that. Because we were on the press side and he didn't have press credentials, but Gil managed it. He talked to his friend and they gave us all press credentials. That was an awesome place to watch from because when the shuttle launches away from you at the press site you are in the press box and it's much louder. It's on the threshold of pain. So if you can watch because it goes right away from you at that point and man is it loud, our clothes are moving, the sound is on the threshold of pain, you are getting right in the burn, it's much brighter than you've ever seen, much louder than you can imagine it, even in the IMAX movie. You know the IMAX movies gave us goose bumps and afterwards it's just nothing. It was just intense. Gil finagled all of this, made Jan nervous, which was kind of worth it just for that. Then we got more AD tours and we got to go in all these places because of Gil's connections. Then we had to drive home. We were so exhausted from the two day trip now that it took us about six days to get back home. So in Mobile, Alabama we all kind of pass out and we're like we have to get a motel in town. So Gil gets a motel and I woke up at 10 the next morning and I get ready and I get Mark up and he gets ready and we get Mike up because he's a sound sleeper and we're ready to go at 11 and no news. I wait till noon and I'm like I've got to call these guys. So I call and get Matt Droter a groggy "hello." "Are we checking out?" In the background I hear Gil say "who in the hell is calling in the middle of the night?" He thought we were calling at 4 AM in the morning. I am laughing so hard and Matt is just out of it. It's noon, you know after 11 before 1, noon. We got to go. Matt says it's noon? You hear Gil say talk to the front desk and get us a hour extension. That wasn't going to happen and about twenty minutes later they were ready to go. If I hadn't of called them they would have slept all day. It was awesome.

As we came back through, G254 had a payload from Houston High School that they gave to USU to make it work. A Kincaid experiment. So we stopped, one of the students was still around, he was in college at the time, but his dad said come on by. So we went by Houston and had dinner with them and stuff and went to Johnson. Gil didn't know as many people at Johnson so it wasn't quite as fun as Kennedy. We stayed at their apartment at Galveston Beach that night and as we came home we came through New Mexico. Gil has family there. We went to a balloon launch facility. A NASA balloon launch facility that I never knew existed and still can't find, but it was right there in the middle of nowhere in New Mexico. We got to see that and see a French payload, a 20 million dollar payload that was going up in a couple of days. It was totally awesome in a place I never knew existed. In the middle of the desert, somewhere near Santa Fe. It's hard to pinpoint where because we were all so exhausted. Then we got home and but that experience was just awesome. The radio communication between, we had CB radios and they suck, six ham radio operators and no ham radios. We had these stupid CBs. The whole

trip was just fun. The most serious ones were Gil, Ragu, and Matt. They kept turning their volume down so they couldn't receive us. They were transmitting and yell at us. We were wondering why we had these radios if they aren't going to turn them on. We would finally get sick of it and speed up and catch up to them and motion to them to turn on the controls. That happened about 8 times on the trip, they just kept doing it. Then they would put their radio in a position where it would transmit. They would hit the talk button, so we would hear them hours on end. Gil, Matt, and Ragu by the end of that trip they were swearing like sailors?. Gil said I have to clean my mouth up, Phyllis will kill me. They would talk all the time and we would tune in on the bands they were using. It was so worth it. Then we would bring up conversations that they had had and they never picked up on that we had been listening.

After G254 it was interesting because we thought we had an experiment, or T-20 seconds are we going to make it? If the countdown stops then they have to abort and reschedule. You are really anxious. Then it launches we've have an experiment in space but then you're like got to get it back. All this tension, but it's hyper-depressing too. You can see the shuttle when it's at its highest point above the Earth and it looks like it's right in front of you. At that point I was like we're trapped, we can't even get off this dirt ball. It was hyper-depressing. It was super exciting but we're trapped we can't even get to the next planet, meaning the Moon. It was really intense. It was frustrating that we're trapped, we can't even get out of our own solar system. That's our close neighborhood cosmically speaking. It was freeing in one sense because it was so exciting seeing that it was going to go and getting above ?? but it was very damning in another sense that this is it, we're trapped here.

You feel kind of small?

It was pretty intense. But then I got involved with G200. Rick Rambo and I initially were principle investigators on the sand and sound experiment. We were going to call it associated sound and sand extreme segregation(?). So the acronym would be ASSES, but nobody would go for it. We were going to see if Watterson, creator of Calvin and Hobbes would do a patch for us. But we never go that far. After summer break we were kind of booted off the team. There was a team of three electrical engineers that redid the whole project and screwed the whole thing up. It was a bad deal. G200 was really frustrating. At the Cape. at integration, we integrated in the space station building. The building was dedicated, but the station was a year behind schedule. So they wanted to use the building. Normally integration is in the RTG building (Radio Thermal Generator building) so I guess it's safe for plutonium and for GAS integrations. So in the space station build that's a freaking big building, it's huge. So we're at the point where we know there's no, we know the experiment is not going to go. we know that the water polarization(?) is only going to go the 8,000 volts and it needs 25,000. We know they just cut the power and data cables for the sand experiment, which is the primary experiment. They cut it.

Why did they cut it?

Because they hadn't even wrote the program. We're at integration and one of the guys was looking for. Do you want names or nameless?

Nameless.

He's at the Cape running around the station building looking for an internet connection so he can download the compiler so he can write the code for the sound and sand experiment. It hadn't even been written and we're at integration. It got to the point where we're there at 3 in the morning trying to make everything work and I'm like we need to stop and give our slot to someone else and spend 6 months and make this work. Three of the guys at integration and Dr. Peak versus me. I said this is bull crap, we're not even flying an experiment. But we've put too

much time into it. There was a significant argument. It was not a small one, heated voices, huge argument. Charlie Knapp, a technical manager, just stood in the corner because he can't take sides. Everybody there was disgusted with the fact that we were just flying garbage. It was very frustrating. The technicians were, it was frustrating. That was the beginning of the end for me, because what are we doing? What are we doing at that point. So Matt's ? experiment became the prime experiment because other two we knew were not going to work. That was very frustrating especially since I was the PI on the sand and sound experiment and I got booted off of it by guys that made it fail. That really pissed me off. I still want data on it, that was a cool experiment. So when we got back it was interesting because I developed one friendship that I didn't think would happen and another friendship kind of evaporated in that whole experience. That was kind of the end of it.

After that with G90 I was still involved somewhat because I did a lot of the hardware. Clint and I designed and built the RPSS, we put a lot of time and effort into that. I was still kind of the machinist to make it happen kind of thing. Design and build stuff. So I still did that, some of the secondary containment and whatnot on G90, but I was much

(Interview cuts off)