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Interview with Terry Thomas

Terry Thomas
Utah State University

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Interview with: Terry Thomas
April 9, 2011
Riverwoods Conference Center, Logan, UT.
Interviewer:

Name: Terry Thomas

Date of Birth:

Place of Birth: Brigham City, Utah

**Question:** Was there an event or events that led to a space career and perhaps to USU?

I had a number of formative events that led me toward engineering. Probably too numerous to mention, but a couple of notables; Utah State for a long time had a bridge building contest and I happened to be very successful and won the state contest one year and that certainly pointed me toward Utah State, but as I worked on the space shuttle related activity in high school it was expected and I finally did submit a proposal to Rex Megill. At the time there was a whole series of students that had accepted and comprised most of the GAS number one team. But at the time because of the shuttle delays Rex had concerns that he couldn’t accept me into the program because of the number of commitments they had already made and they didn’t know when they were going to fly. So I said well that’s ok there were other payloads in the cue or expected already, not just number one. So I submitted my proposal which was a alloying (?) kind of experiment and it was accepted. Then a few months later, after I became an active participant, Rex approached me and said are you going to be on the first payload or not? So that was an easy answer to say yes and that became ten experiments. I was the last researcher or principle investigator to jump on the first Get Away Special.

**Question:** When did you join the GAS team? Were you a GAS student or a GAS mentor?

I initially started as a participant, as a principle investigator. After GAS 1 a lot of the other participants on GAS 1 had graduated and were finishing studies but I was a sophomore. For me it was quite a bit different. It was hard to think I had done my four year project in two years and now what do I do? I continued to work on my academics and ended up being a consultant and an EE designer for several other projects. Russ Laher had other projects, some others, too numerous to mention. So we flew, we had a lot more success after GAS 1. I’m sure other people will document that the fact that we turned on very late on that launch and that resulted in real extreme low temperatures and made it very difficult for any of the projects to work properly with reduced battery capacity.

**Question:** When did you leave the GAS program?

I stayed until I graduated in ’85. At the time Dave Yoel had accepted a position at Boeing Aerospace a year or two earlier and had been working on a mid-deck experiment and basically he hired me. So I went from doing student rated payloads with low level funding to a full professional career working on a space shuttle mid-deck experiment. That took another six years for that project to finally be flown. Of course the Challenger accident had a big role in delaying that lengthy project.
**Question:** In the context of the GAS program how would you describe your skill set before joining the GAS team?

I always had a very hands on background. I had done a lot of mechanical related stuff. Obviously the bridge building so I had a pretty good awareness of a lot of building and so I felt like I had a pretty good skill set. What I didn’t have a really good skill set on was electronics. That kind of steered me toward EE as I initially came into Utah State in the Physics department. I worked for CASS, I worked for a number of people in the atmospheric space science group over the years and ended up cultivating not only all the mechanical experiments that they had but the electrical as well.

**Question:** Upon leaving the GAS team how had your skill set changed?

Well I think they expanded in all areas. The diversity of the factors that are critical for developing a successful experiment are difficult enough, let alone doing it in the space environment and having the safety and other review processes. So it really gave you what you might call a “cradle to grave” look at a project. The fact that you were involved in a multitude of levels really gave you a overview of the whole project, engineering process. In that context it is very difficult to underestimate the value of that diverse exposure. If you were doing another project you may have went and built something, but you didn’t have to go through the rigors of documentation and some of the other processes. So that made it all that much more interesting, plus challenging, plus you got the bang in the experience area.

**Question:** What was your USU major or degree?

I started out in physics, but I went over the EE and by the time I graduated I had my degree in EE and had started taking graduate course in EE. I had business and math minors.

**Question:** What GAS projects did you work on?

Predominately GAS 1. I never re-flew my experiment. I potentially could of done that, but there were other students working on their projects and I felt that supporting them was the best use of my time going forward.

**Question:** Do you recall names of GAS team members working on these projects with you?

I recall most everyone who was on the GAS 1 team. There most certainly was a high degree of bounding if you will. A lot of those relationships I have maintained for many years and this event has been very special to reconnect with some of the people I haven’t seen for a period of time.

**Question:** Did you get to experience GAS road trips?

We had, there were a number of things, there were things in the road trip area where we went cross country. Most of the team drove cross country down to the Cape and I joined them down there and then we drove back cross country through Houston where we were trouble shooting the payload being enabled, then out through El Paso and out to Edwards Air Force Base. Notably we got to see a shuttle launch and a shuttle landing and we got to see President Reagan’s famous 4th of July speech in ’82. So there’s a number of highlights there. There were a lot of other significant activities. For example we had so many starts and stops because of the delays in the shuttle program we did a lot of assembly and disassembly of the hardware. We got really adept at doing that but when we started doing our final integration work
one of the things I recall was some of us was working a 48 hours on and 24 hours off shift just to get everything ready during crunch time. So I had a lot of those kinds of things.

The other thing that was very interesting was that because we were the first Get Away Special team student payload on the shuttle there was an enormous amount of media scrutiny, but interest. The University did a very smart thing. They had us go through a kind of interview process up in the studio and gave us some exposure to some interviewing and video taping experience to introduce us to that. That served us very well. That was not easy, there were many of us, including myself, that were not comfortable speaking in front of a camera or audience but that was certainly going to be an expectation and so that preparation served us well. We were interviewed countless times by a lot of organizations in the ensuing weeks.

We also had a fair number of awards. As I recall we were nominated for a Robbins Award for Achievement of the Year and we won that. We were also made grand marshals of the homecoming parade. Nice things that you wouldn’t have expected out of doing something so academically oriented. So there were so many other things, the number of interviews, the opportunities we had to broaden our experience, not just building an experiment.

**Question:** What is your most cherished recollection of your GAS days?

You know I think some of those times where some of the singular events that put things in perspective. I just had a flashback from what Jan Sojka had mentioned to me yesterday about doing some CNC machining. At the time, back in the early ’80, there wasn’t any CNC machining, so any machining work that we had to do we literally had to set it up and keep measuring and doing everything in a manual way. We didn’t have any computer models. I built an entire thermal model with differential equations and cranked them out on a calculator. There were no spreadsheets and the Fortran code that would have been available to us at the time would have been just too difficult to manipulate in creating a finite model. I remember very distinctively Gil Moore coming into one of the meetings we had, one of the weekly meetings, and he had something very special to show us. We all gathered around and he had what amounted to a portable computer. A laptop if you will. Certainly not the kind of laptops that we’ve got and he showed us a spreadsheet for the very first time. So we were able to use that and that helped us in the integration area and tallying some things that just were harder to do with pencil and paper. You could tell that the sophistication of the payloads, the manufacturing processes, all of those things changed over the years. What didn’t change was that in this kind of program you always had the opportunity to go chase something of any curiosity and do something in microgravity. That by itself is something special. So anything you do in space is something special.

**Question:** What was your greatest frustration with the GAS Program?

I think unique to the Get Away Special number one was NASA had initially thought there would be participation by companies, which there were, but since we ended up being a path finder and being the first one they rolled out, they kind of threw the regular safety process at us. It was just overwhelming and it was a misuse of the process in a sense not that it wasn’t important, but the intricacies and all of the as you call it “red tape” became apparent and it just about stopped our progress for quite sometime as we struggled to go through and digest what that meant and how to respond to it and how to prepare. There weren’t very many things that we weren’t doing. My particular experiment was hottest of them and it wasn’t that hot. We weren’t trying to push those experimental boundaries, but at the same time that safety process we had a
lot of feedback, push back to NASA and they made changes in turn that resulted in the red handbook that everybody used. Otherwise it would have been extraordinarily difficult for the rest of the Get Away Special team to follow the same suit. Rex and Gil were constantly challenging the process. They weren’t negating the safety requirements, but the process and the rigor was probably not appropriate and it wasn’t needed in many cases. So that was probably the most frustrating aspect because we were always redoing things and making modifications that really took a big toll on our progress.

**Question:** Please describe your present day career. Especially mention to what extend it follows a projectory dating back to school and USU GAS days.

As I mentioned Dave Yoel, after he graduated with his masters, he went to Boeing and I followed him there and then we worked together for a number of years. He left Boeing but in the time that Dave and I were there and having influence at Boeing, Boeing flew three GAS and/or mid-deck, not mid-deck, but shuttle bay payloads, with our assistance. I tried to introduce the Get Away Special program to the University of Washington and got them through one payload. The Challenger accident and just the general lack of other space related activities at the University of Washington precluded them from maintain that as an opportunity. They had interest in doing it, but as in other institutions they just didn’t find the continuity that we have here at Utah State. That makes the Utah State experience, the infrastructure, the personnel over the years, all that much more special.

I continued to stay at Boeing. I worked in other areas of avionics but a lot of research oriented projects and I’m now in the commercial airplane division working in their product development group. I get to do all the things that are fun for EE to do and I get to do them on thousands of airplane that we build.

There were a lot of things that enabled me. I remember one time when you are in the Get Away Special program often times you are having to prototype things pretty quickly and scrounge and do a lot of creative things to meet your objectives. Then I carry that into Boeing. I remember distinctly one time when I was working on a project that could not, it was just impractical for me to sit down and do a very detailed drawing on the concept so I built the concept out of Legos. Once I showed what the concept was, it was very easy to gain acceptance of the concept. For the fact that we did it in a couple of days instead of sitting down and trying to draw, a whole series of drawings, to illustrate what we were proposing to do. So I think that always gave me a lot of, it takes some time to kind of reflect back on the things I’ve done at Boeing. I’ve now been at Boeing for 25 years. I suspect that I use things that I cultivated and developed when I was in the GAS program practically on a daily if not weekly basis.

*Well, thank you Terry.*