

Nick Buehler

Graham

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The Way We Worked Essay Contest

For my report on a person in the workforce before 1975, I interviewed my grandfather, David Shrewsberry, who was an Electrical Engineer and Engineering Manager. He worked at the NASA Goddard Space Flight Center designing, building, testing, and launching sounding rocket and space shuttle payloads and small satellites. He worked at NASA from 1964 to 2001, which is 37 years. He retired in 2001 and now works part time at his "fun" job in a boating supplies store. He went to college at Ohio State for four years and majored in Engineering, which is where he got most of the knowledge to do his job. After college, he wanted this job because it involved traveling and was fun, because he got to help build and launch rockets. He was good at this job because he had a degree in engineering, was interested in the work, was able to make significant contributions, and was able to see the results of his work. The rest of his training came from experience on the job. His first salary was around 10,000 dollars per year, but as he got promoted and got better at his job, his salary gradually went up. His main working hours, if he wasn't away traveling and launching rockets were from 8:00 until 4:30. At the beginning of his career, he programmed, tested, and integrated attitude control systems with the other systems on the rocket. Then he launched the rockets. When preparing and launching the rocket, there are four jobs that a person could be doing. He was an attitude control system engineer, but there were also engineers and technicians for the rocket engine, instrumentation, and flight performance. In his job, he used a large mainframe computer which used punched

cards for data input, a mechanical calculator, and a slide rule. The calculator was called a Friden Calculator, and it could add, subtract, multiply, divide, and even do square roots to high precision. Typewriters were used exclusively because there were no word processors or other PC based office equipment.

He had lots of fun at this job and got to travel to lots of interesting different places. Some of the places that he got to travel were White Sands, New Mexico and Australia, as well as to contractors in Los Angeles and Boulder, Colorado. Most of his launches occurred in the desert of White Sands, New Mexico because it was a large, flat, uninhabited area. It was a good place for launching rockets so that the payload could be easily recovered.

His sounding rockets could go anywhere from 100-400 miles above the earth's surface, depending on how big the rocket was. The rockets were pretty big, and they ranged from 15-44 inches in diameter and 15-50 plus feet long. Most of his sounding rockets were shot up into space to be used as telescopes, because your vision is partially blocked by the atmosphere when using telescopes on Earth. From telescopes in space you have a much clearer view of stars and planets. Some of his rocket telescopes measured the wavelengths of light given off by stars and other celestial objects. Other telescopes took in X-rays from stars. Some of his rocket telescopes even took pictures of the Sun, using a coronagraph. A coronagraph is an instrument used to take a picture of the Sun in which the camera blocks out the part of the Sun that we see, the photosphere, so that the corona of the sun is more visible.

Some rockets had payloads that could weigh as much as 300-400 pounds and be 10 feet long. After the launches, helicopters were sent to recover the payloads because they were so heavy.

As technology advanced, he designed and improved attitude control systems using “new” things known as personal computers and integrated circuits. His systems became smaller, more accurate, and more reliable as technology improved.

As the Space Shuttle came into being, my grandfather David developed plans and concepts to transfer low cost sounding rocket technology for use as part of Space Shuttle payloads. He originated the concept of Spartan payloads, which first flew on the Shuttle in 1985. He worked with numerous astronauts and served as the Mission Manager for the first Spartan Mission. Spartan payloads were typically about the size of a VW Bug. The Spartans took X-ray and ultra-violet pictures of stars, and, like some sounding rockets, used coronagraphs to take spectral pictures of our sun’s corona. After their missions, all of the Spartans were successfully recovered and all data and pictures retrieved, which was an awesome feat for the project. A total of seven Spartan missions were flown, with one payload being flown three separate times. Unfortunately, there was one Spartan that was on the Challenger that was to observe and take pictures of Halley’s Comet, but it was destroyed when Challenger exploded. Halley’s Comet is a comet that returns to our inner solar system every 75 to 76 years. It was last seen in 1986, and should next appear in mid-2061.

My grandfather progressed in his career from a “hands-on” working engineer to an engineering manager of a large group of people, but he said he most enjoyed the times when he could create and test things on his own. He also enjoyed and appreciates the advance of technology in all areas—from vacuum tubes to individual transistors to integrated circuits, typewriters to word processors, from slide rules to personal computers, and the like. While he was working, my grandfather made some close friends that he still keeps in touch with. He values these friendships and associations above all else related to his work. On the first

Thursday of every month, he meets to have lunch with a small group called the ROMEO's. It stands for Retired Old Men Eating Out. They meet in the cafeteria of the Goddard Space Flight center, which is where most of his working on the rockets took place.

Sounding rockets are still being used today. The job he started with is different today than it was when he worked there because technology has gotten more advanced, and NASA doesn't use sounding rockets as much now as they used to. Now they have and use more satellites, which can stay up in space for longer.

I think that my grandfather's job was very interesting and exciting and I learned a lot about what he did when he worked for NASA. He won the NASA Medal for Outstanding Leadership for his contribution to the Spartan Project. The first Spartan was displayed in a special exhibit at the Smithsonian Air and Space Museum in Washington, DC, and another Spartan is currently on permanent display at the Smithsonian's Steven F. Udvar-Hazy Center at Dulles International Airport. I had fun interviewing my grandfather for this paper, and I am very proud of what he did.