

What Do You Mean, “Astronaut Candidate”?

If you are reading these stories in sequence, you will recall in the previous story, I talked about a stressful application process that was more than a year long, with some months- long periods of waiting for information about whether I had made it to the next step or not. And then after the euphoria of learning I had been selected and would report to the Johnson Space Center in Houston in July of 1978, there came the realization that we (the class of 1978, the TFNG’s—“Thirty Five New Guys”) would actually be in the status of Astronaut Candidates, for possibly as long as two years! One can conjure up any number of possible outcomes of such a status, and I think our Class was the first to have this distinction. But quite frankly, what turned out to be just a one year period for our class was actually a much needed period for all of us to learn how NASA operated and just how much we did not know that we should know, and that it was going to be a non-stop cram session to even start to close the gap. Probably the major gap to close was to learn about the massive amount of technical data that described the Space Shuttle and all its many systems, their operation, and how they worked together throughout a mission. And, of course, each system had its myriad malfunctions that could happen, and those were mandatory to learn. Coupled with that, was the need to become familiar with all the aspects of the ascent, on-orbit, deorbit, and entry/landing portions of a typical mission sequence, and all the software connected to each phase. My academic background provided some knowledge in some of these areas, but the devil is usually in the details, and there were lots of those. In addition to these “must know” topics, NASA was interested in well-rounded individuals serving as Astronauts and mission spokespersons, so there was exposure to many disciplines I had never studied before, presented by very accomplished and well known professors, or subject experts. There was geology, oceanography, space physics, astronomy, some medicine and dentistry, photography, and some other areas I am forgetting. And there were field trips to help learn details about some of these areas. Despite the crunch to learn all the technical “stuff” about the Space Shuttle and its operation, this limited exposure to some of the areas I had never been exposed to was a very enjoyable part of our “Astronaut Candidate” year. And, there was the beginning exposure to all the various simulators NASA had developed, or was developing, for Space Shuttle training. The most basic of these were single systems trainers that exposed one to just one Shuttle system at a time, so you could “master” each one separately. There were also simulators for training for a specific task, such as rendezvous and proximity operations. And then there were the Shuttle Mission Simulators, both a fixed base and a motion base, which could be used to practice entire mission phases, repeatedly, with any number and combinations of malfunctions inserted to help crew members identify what was wrong, and recover from the effects of the failures. It is impossible to experience actual space flight phases while still remaining on the ground, but the NASA simulators helped tremendously in all areas. For the Pilot Astronauts, probably the best simulator the Space Shuttle Program had was the Shuttle Training Aircraft (STA). These were Grumman G2 large business jets converted to Space Shuttle training aircraft, by removing seats, and installing a bank of computers that controlled the flight of the aircraft when the instructor engaged the “sim mode.” The left seat had a Shuttle hand controller, which was active in sim mode, and the Astronaut crew who was training had the same hand controller as the Space Shuttle, and the bank of computers actually made the STA fly as

close to the actual Space Shuttle as possible, given the aerodynamic differences between the actual Shuttle and a Grumman G2. Each Commander and Pilot spent hours flying the STA before their first Shuttle mission, practicing the final portion of the Shuttle landing profile hundreds of times before flying their first mission. The key fact to remember for entry and landing of the Space Shuttle is that after the deorbit burn, the Space Shuttle was a glider for the rest of entry and landing, with no second chance of a go-around and re-try of the landing. The whole process had to be precise the first time, and that is after the deorbit burn happened half way around the world, at Mach 25, at an altitude of a few hundred miles, above the atmosphere, in a glider that had an L/D ratio in the neighborhood of 3.5 to 1 (akin to a brick)! The engineering marvel that was the Space Shuttle: 1) A vertical launch rocket that weighed about 4 ½ million pounds at liftoff; 2) which inserted about 250,000 pounds into low earth orbit; 3) then operated for days as a spacecraft while completing its missions; and 4) completed entry and landing while starting entry as a spacecraft and slowly transitioning to an aerodynamic glider for landing; is a true testament to the vision, engineering design and development, testing, operation, and reusability of spacecraft capabilities of the USA. No other country has done this!

Whew! Sorry, got carried away there. As the end of the first year of our Astronaut Candidacy was approaching, the Space Shuttle Program was making good progress, and NASA decided that the Class of 1978 was ready for direct participation in the Program. Members of the class were assigned to various tasks in direct support of the first few missions, and it was declared that we were not really “candidates” any longer, but full members of the Astronaut Office at Johnson Space Center, and actually eligible for assignment to Shuttle crews. It took several missions before members of the class began to be assigned to crews. The next story will relate some of the support we provided to the early Shuttle Program missions.

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USAFA Class of 1967

(Story #3)