

15



The legacy

*“For those who have seen the Earth from space,
and for the hundreds and perhaps thousands more who will,
the experience most certainly changes your perspective.*

*The things that we share in our world are
far more valuable than those which divide us.”*

Don Williams quote, recalling his observations from orbit:
From “Eyes Turned Skyward.” [1]

Those words from Don Williams summarize the bond that all space explorers have felt over the past six decades, witnessing with their own eyes the beauty and fragility of our planet from orbit. The desire to apply for astronaut training burns strongly in many of us, but having the skills and the opportunity to put that dream into practice is a completely different matter. First there is the challenge of progressing through the selection process. Then, if successful, comes the basic preparation course to qualify for assignment to a space flight. After this is the waiting, perhaps for years, for the opportunity to fly for the first and perhaps only time, although there is always the hope for more. But leaving the Earth and arriving minutes later in orbit has to be worth all the effort and sacrifices to get to that point.

Taking a space flight has never been a solo event, even in the days of single-crew spacecraft. There is a whole team, or rather a community, behind those who fly. That team, whether national or international, designs the missions, manages the program, builds the hardware, tests the systems, prepares the vehicles, and controls the operations, then moves on to repeat their part of the sequence in time

for the next flight. At the forefront of all this are the flight crew, the small group who are in the public (and political) spotlight to execute the objectives and bring the results home. Superbly prepared and trained, each flight crew is a group of highly talented individuals who mold together over time to become a single unit. Trust is important, between each other, with those on the ground, and with the hardware and software around them. Isolated from the home planet, the flight crew is totally dependent on all the equipment and procedures working well each and every time, or on possessing the knowledge and capability to overcome problems when it does not.

Sometimes events happen so fast that, no matter how good the preparation and training, fate demands a different outcome. In his presentations to the public, after asking his audience, by a show of hands, which of them would like to ride on a rocket to space, Skylab 4 astronaut and member of the Group 8 selection board, Ed Gibson, usually reminds them that each of the several million parts of the vehicle have to work as designed, first time, every time, and that those parts are usually provided by suppliers who came in with the lowest bid to build them! When he asks again who would volunteer to fly, the number of hands shown usually reduces considerably. Space flight is, and will always be, inherently dangerous and a risky profession. No matter how far we progress and develop our capabilities, there will always remain the elements of surprise and luck, potential failures, and unfortunately the possibility of a tragedy.

Those selected to partake in such an exciting and dangerous adventure as an astronaut will know that their colleagues have gone through a similar journey in order to reach orbit, and most will probably become close friends as well as trusted colleagues over time. The original 73 astronauts chosen between 1959 and 1969 were the American pioneers of the new frontier called space. Their dedication provided the human element of the system that demonstrated the United States could launch men (no women at that time) into space, and even send them to the Moon, support them while there and get them home alive. It was built upon their aviation and professional skills and was emblazoned across the media over the years; in particular Tom Wolfe's 1979 book *The Right Stuff* and the 1983 feature film derived from it. However, by the 1970s, this pioneering spirit of adventure had changed. The so-called race to the Moon against the Soviets was won and there was now a new focus on space exploration, mostly looking back at Earth "for all mankind," as the plaque on the Apollo 11 Lunar Module (LM) *Eagle* proclaimed. The program and its objectives had to change, opening up new opportunities for new participants over the long term. Part of that adjustment came with the Space Shuttle and the selection of a new generation of astronauts to fly it – the first of whom were the Thirty-Five New Guys (TFNG) of the NASA class of 1978.

A CLOSE-KNIT GROUP

Some of the military pilots had worked together in the past while others had met during the selection progress, but now they were a new tight knit group, not only because of the media attention but also because of what they had to go through and learn at NASA. They were the first to be classed as Ascans and the first group to train specifically for the Shuttle, and they were heavily involved in preparing for its first flight and supporting the early missions. Then there were the obvious ‘firsts’, with the inclusion of women and minorities in the NASA Astronaut Office, and the selection of the first Mission Specialists (MS). As with previous groups, the TFNG set up home in the suburbs around the Johnson Space Center (JSC) in Houston, Texas.

For several years the group were close-knit, and though they naturally started to drift away from the Astronaut Office as time wore on, they still kept in touch, as Jeff Hoffman recalled in 2009: “For the first couple years, we definitely had a lot of parties and really built up a big rapport. I think that our group in particular [the TFNG] kept that, and in fact we’re the only group that has had regular reunions just on our own. We had a ten-year reunion and a 20-year reunion in Houston, and then last year for our 30th reunion in 2008, since we were all Shuttle astronauts, we figured that by the time our 40th reunion came around the Shuttle wasn’t going to be flying anymore, so we had our 30th reunion in Florida and watched a Shuttle launch. It was great. I think about 20 people came. A large number of the group showed up. I guess there’s 29 of us still alive. So yes, I think you get quite close. Over the years, as we started to get assigned to missions, people went off in different directions, and we didn’t have quite so active a group social life as we did the first two or three years. But it’s an important way to bond with the people you’re going to be working with, and I really enjoyed that.” [2]

For the record

The 1978 Group 8 astronaut selection was only the third group since 1959 to have *all* the members of their selection (35 in this case) achieve at least one space flight. The other two groups were the seven original Mercury astronauts chosen in 1959, and the seven former Manned Orbiting Laboratory (MOL) astronauts who transferred to NASA in 1969.

THE LEGACY OF THE TFNG

During the 1950s, a wide variety of images emerged in popular culture which depicted astronauts exploring new worlds and constructing huge structures in space, as well as vast colonies on the distant planets. These were different

pioneers of space exploration. Like the American Wild West of the 19th century, these were more like homesteaders, technicians and professionals, establishing an infrastructure away from Earth with which the human race could expand safely beyond the home planet.

We may still be some way from such predictions coming true but we are moving closer. As the first step beyond *The Right Stuff* American pioneers of human space flight, the TFNG represented a shift in the perception of what an astronaut was. They were no longer required to be 'hot-shot' fighter pilots pushing the limits of their vehicles and risking their lives for the greater good. Instead, these were a far more diverse generation, breaking the molds of what had gone before and creating new models to admire and emulate. There were pilots of course, selected to fly the Space Shuttle and command the missions, but there was a new designation in NASA parlance – the Mission Specialists. They were professionals who did not have to pilot the vehicle to and from space, or even move the vehicle once there. These astronauts focused on the mission, the payload, the experiments and the objectives. They were the ones who created research studies in space as well as operating experiments; they helped American astronauts regain long-unused skills in Extra-Vehicular Activity (EVA), rendezvous and proximity operations, and docking, and acquire new ones in satellite operations in Earth orbit. The TFNG had their roots in the decades of unrest and change in the United States and around the world following WWII, as education and opportunity for betterment devolved away from a select few and gradually encompassed minorities and females too.

People, especially the young, need role models to aspire to, and the TFNG provided a greater diversity of such role models for a wider range of people, though they were often unaware of how much they did inspire a younger generation to strive for success in the class room, at work, in the military and in the world at large. There are many astronauts who followed the Class of 1978 into space who have commented that seeing the TFNG lead the way made them dream that they, too, could achieve if they worked hard and persevered. Inspiring the young to persevere and to achieve is, perhaps, the most lasting and noteworthy legacy of the Class of 1978, probably more so than the space flights each completed.

None of this had been done before in this way. The job description was different, the selection process was different, and the training program was different. Their space vehicle was certainly nothing like what had come before, but the reward was the same as for the veteran space explorers – a flight into orbit to see our planet in all its glory. Once there, the pilots looked after the Orbiter, but it was the MS, supported by the Payload Specialists (PS) and helped out at times by the pilots, who fulfilled many of the mission objectives as enthusiastic participants in science research.

The TFNG helped to develop new techniques and systems for training and flights before moving into higher management at NASA or out into the wider space industry. The remaining members from earlier selections may have helped

to develop the Space Shuttle program from the drawing board to the hardware, but it was the TFNG who molded it into an operational system for others to use for over two decades until the program's closure. A few went on to work on the emerging Space Station, applying skills learned on Shuttle to that new program and those which followed it.

Right from the start, the TFNG had a hand in developing the Shuttle training program and the roles of the support team. They expanded the role of the MS-2/ Flight Engineer (FE), molded the responsibilities of the Payload Commander (PC) and pushed the boundaries of EVA and robotics. Their work in small pressurized laboratories aboard the Shuttle laid the foundations for the program of research on the U.S. segment of the International Space Station (ISS).

From before the first Shuttle flight until just after the final mission flew, members of the Class of 1978 were there, in active flight or support roles, in management or in the space industry. These 35 very determined individuals created a new image of a 'group' or class, as a single unit rather than individual characters. Following NASA Group 8, each astronaut group came up with its own identity, including a nickname and emblem, to identify the 'family' of that selection in more ways than the first seven groups ever did. The NASA that had sent the first American astronauts into space had changed considerably when the TFNG arrived at JSC. It also evolved significantly through the four decades they were there, and was changing again as the final members left the Astronaut Office or the space agency, handing over the mantle to new classes for them to make their own mark on American and human space flight history.

NASA AFTER THE TFNG

Among the 73 original astronauts, there were natural leaders and characters, pioneers and heroes. They were modern-day trailblazers and iconic figures whose exploits and achievements created the myth and ethos of the Astronaut Office during the 1960s, as immortalized in *The Right Stuff*. As remarkable and inspiring as this early era was, it would not and could not continue in the same vein. Pioneers have always given way to the next, second generation of explorers that exploit and expand upon what was achieved by the vanguard and set the course for the subsequent generations of settlers, to establish an infrastructure and systems to build further. The 35 men and women of Group 8 were the first of this second generation of American astronauts. They took the Astronaut Office from the 1960s into the 1990s, and evolved the program from Apollo to the Shuttle and on to the ISS. It is at the ISS that the third generation is currently establishing the foundations for the next developments in the history of American astronauts, the settlers and homesteaders.



Fig. 15.1: At the Kennedy Space Center in Florida in 2014, Anna Fisher, the last of the TFNG remaining with NASA, casts a keen eye on the work being carried out to prepare the Orion spacecraft, one of the next generation of American spacecraft to carry astronauts. The crews will not feature members of the TFNG, whose time at the forefront of American space flight had lasted an impressive four decades. But the legacy of the group is assured by their achievements and in the changes made in the Astronaut Office.

New Roles in the Astronaut Office

Following the retirement of the Shuttle in 2011, there has perhaps been even less requirement for pure ‘pilots’ in the NASA Astronaut Office, with no new vehicle to ‘fly’ for some years. For almost a decade since the grounding of the Shuttle fleet, the use of the Russian Soyuz to take the crew to the ISS has meant that not one American has been in command, or officially allowed to control, a small crew transport space vehicle into or out of orbit, or in solo flight. Those aboard the space station as increment crewmembers are designated as Flight Engineers or single Increment Commanders, and while they can be American astronauts, the roles have not necessarily been filled by professional pilots. The fact that *all* Soyuz spacecraft have been commanded during ascent, orbital flight and descent by a Russian cosmonaut further restricts the opportunities for American pilot astronauts. Interestingly, Soyuz Commanders have not always been military pilots, with a few chosen from the cosmonaut engineer team. In saying this, over the last 25 years a handful of foreign nationals (including, since the early 2000s, a few NASA astronauts) have trained as Soyuz Flight Engineer 1 in the left seat position. That means they are qualified as center seat Soyuz Return Commanders in

the event of an emergency, although such a situation has fortunately not yet arisen during a mission.

From 2020 onwards, it is planned that new American human spacecraft will begin to fly with a crew. The SpaceX Crewed Demo-2 mission will include a Commander and ‘Joint Operations CDR’, although the crewing roles for the Boeing CST-100 Starliner crew remain to be determined beyond that of Commander. Crew positions and roles for the additional crewmembers on each spacecraft are still to be formally announced, though over the past few years NASA has used the terms “Operator-1” or “Operator-2” for future planning purposes, not necessarily as confirmed crew designations. Any crewmembers that transfer to an expedition crew on ISS will revert to the Flight Engineer expedition designation.

Since the retirement of the Shuttle, the role of MS has demised as well, as all crewmembers who fly to the ISS are classed as ‘Flight Engineer’ initially. During the change of increment, one will be ‘promoted’ to station commander for the duration of that new phase. So, is the position of MS now as redundant as the Apollo Command or Lunar Module Pilot became after 1972? The MS role was created for the Space Shuttle program and astronauts are no longer chosen under that designation, so the position was very much of its time (1970s–2011) and those skills and experiences are changing as the program moves on. TFNG Steve Hawley, who flew five times as MS-2/FE, thinks some elements will remain the same, but the role and thereby the identification will change. “If you look at it from the ground up, I think you are still going to pick people who have the hard core group of basic requirements, things like good technical skills, good teamwork skills, good leadership skills, good communication skills and some operational capability. On top of that, I think there is a lot to be said for having a diversity of those experiences. Again, I go back to saying that the pilot culture would be ‘Give me the procedure and I’ll go execute’, and the scientist culture might be ‘Give me the procedure and I’ll give you some improvement’. That’s what I see in the last couple of selections, for people that are presumably going to get to fly the missions on Orion. These people could have been called Mission Specialists, if you reflected off the Shuttle, because they have a lot of the same background, but now the jobs they’re going to do are going to be different, though I don’t think that the skill set is all that much different. Just the name of the role.” [3]

The first of a new generation

On January 10, 2020, a week shy of the 42nd anniversary of the Class of 1978 being announced to the world, NASA held another ceremony at JSC to state that the members of the 22nd group of astronauts (The “Turtles”) had graduated from their two-year Ascan basic training program and were eligible for flight assignment. At the ceremony, NASA Administrator James Bridenstine commented that this was the first class to receive their Silver Astronaut Pins under the new Artemis

program, which aims to send the next man and the first woman to the Moon by 2024. Class members from this selection would now be available for assignment to expedition crews on ISS, launched aboard the new U.S. commercial crew spacecraft. They may indeed reach the surface of the Moon, over five decades since the last men of Apollo departed, and may perhaps become one of the first humans to step onto the surface of Mars. To suggest that men and women could crew such missions together shows how far the program has evolved since the TFNG stepped onto the podium at JSC at the beginning of the Shuttle era of American human space flight. Now a new generation of astronauts has taken up that challenge to forge, together, the next steps deeper into space.

References

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