

## Air and Space this Week

### Item of the Week

## FRANK BORMAN

Originally appeared month day, year

**KEY WORDS:** Frank Borman Gemini 7 Apollo 8 Genesis Eastern Airlines

*Frank Borman was the commander of the long-duration Gemini 7 flight, and also Apollo 8, the first spacecraft to orbit the Moon. He had a number of other important jobs, within the Air Force, within NASA, and after his service in both organizations. He ran Eastern Airlines for a number of years, and passed away two weeks ago, on November 7, 2023, in Billings, Montana. He was quite a guy, and is the subject of this week's Item, as promised last week.*

### EARLY YEARS

Frank Federick Borman II was born on March 14, 1928, in Gary, Indiana. The weather disagreed with his father, a second-generation American of German heritage. [I suspect the rampant air pollution in Gary may have been at least partially to blame.] They moved to Tucson when Frank was still quite young. Like so many future astronauts, he became enamored with flight at age five, when he had his first airplane flight.

He enjoyed sports throughout primary and secondary school, including starting at quarterback on his high school team, after the first-stringer had suffered a broken arm. The forward pass was not his friend, but he had to be pretty darn good, because his team won the state championship. He was an honor student, and like Neil Armstrong, he got his student pilot's license at age 15, before he got his driver's license.

Frank was in a bit of jam at that point. His grades were good, but he wanted to study aeronautical engineering, not then offered in Arizona. His parents did not have the funds for him to go out of state, and he was too small to get a football scholarship at a big school, in spite of the state championship. The Bormans did not have the pull needed to get him appointed to a service academy. What to do?

The father of a friend had been talking with Frank about his future, and knew of Frank's desire to have an aviation career. Frank told him that his Plan B for college was to enlist in the Army, and then use the G.I. Bill to finance it. The friend's father listened, and then acted. He did know the sole House Representative for Arizona, and through him got Frank the possibility of a West Point slot. But he would be the third alternate, with three others ahead of him. He was able to take the West Point entrance examination and physical, and passed both with flying colors. Those ahead were less enamored with the prospect of a military life, so soon after the end of WWII, and between that and his grades/scores, Frank got into the class of 1950.

Many of his new classmates were significantly older than Frank, and already had not only military experience, but *combat* military experience. Nonplussed, Frank approached all aspects of life at the Point with diligence and skill, and by his senior year, he was a cadet captain, commanding his company, and was the manager of the varsity football team. He would graduate 8<sup>th</sup> in a class of 670.

The Air Force Academy had not been built in 1950, and the nascent Air Force was authorized to take a number of graduates from West Point. Frank opted to join that cadre, and was commissioned as a 2<sup>nd</sup> Lieutenant on June 2, 1950. He was given the customary furlough after graduation, went back to Tucson, took up again with his high school sweetheart, Susan Bugbee. They were married on July 20, 1950.

Frank had his choice of paths to pursue for flight training, due to his outstanding grades. He opted for fighters. He trained at Nellis AFB in Nevada, and would win his wings two months after the birth of their first child. The Korean Conflict was heating up, and Frank was in line to go, but suffered a punctured eardrum, which kept him from flying, even though he was accompanying his squadron to their base at Clark Field in the Philippines. He was able to convince the medicos that he was OK to fly again, and they finally relented and restored his flight status. He rotated back to U.S. just after the birth of his second child. His next assignment was as a jet instrument flight instructor at Moody AFB in Georgia. In 1955, he was transferred to Luke AFB outside of Phoenix, then and now a jet flight training base. He began flying top aircraft of the day, including the F-80, then the F-84.

## PRE-NASA

The brass was impressed by Borman's flying and his abilities as a student. He was ordered to join the faculty at West Point, which would require him to earn a Master's degree. He wanted to move quickly on this opportunity, and looked around for a degree he could finish in one year if he worked hard. Cal Tech had an outstanding aeronautical engineering program that a hard charging smart guy like Frank could conceivably finish in a year's time. He went for it. He graduated in June, 1957, and went to West Point, where he would teach until 1960. He loved the assignment, and he could fly a T-33 jet to his heart's content on the weekends.

Teaching was great, but Frank wanted to take his piloting to the next level and applied for the Experimental Flight Test Pilot School at Edwards AFB in early 1960. He was accepted, and after the Spring semester was over, he headed for southern California, a member of the EFTPS Class 60-C. They were an outstanding bunch; Michael Collins and James Irwin were classmates, and future astronaut Tom Stafford was one of their instructors. Again, Borman excelled academically, and was one of the five in his class selected for the Aerospace Research Pilot School, a training academy for future (military) astronauts; future astronaut Jim McDivitt was one of his classmates there. He was in the big leagues now, learning more esoteric material such as orbital mechanics, flying in the "Vomit Comet," and learning to fly the F-104 Star Fighter.

NASA had selected the seven Mercury astronauts in 1959, but they were looking for more, and Frank applied to be in Group 2 in 1962. Chuck Yeager was commandant of the Edwards Test Pilot School at the time and strongly discouraged Frank and others from following that career path, but Frank was a man of strong opinions and firm commitments, as we shall see. He ignored Yeager's advice and did apply, and was one of 11 that the Air Force offered up to NASA. He was selected as part of Group 2, the "Next Nine." They would help NASA finish up Project Mercury behind the scenes, and then be in line for Project Gemini.

## NASA

Building an entire Space launch system was an enormously-complex task. Each of the seven Mercury astronauts had individual specialties assigned to them where they would work with designers and engineers, both NASA and contractor, providing astronaut input on the systems they would need to complete their missions successfully. For example, Wally Schirra's area was the spacesuits needed for Mercury, John Glenn's was the organizational layout of the Mercury capsule, etc.

Frank was assigned to the Titan II booster as his area of specialization. The Titan II was a liquid-fueled beast, powerful enough to get the Gemini capsule to orbit (it was at the time our basic ICBM), but touchy. Getting away from one if something bad happened could be a problem. Frank worked with the engineers of Martin Marietta, the prime contractor for the Titan II, to help develop an automated abort system, since things could go boom faster than a pilot's human-speed reaction time could accommodate.

In addition to learning their own specialization, the Next Nine had enormous amounts of classroom instruction on a variety of Spaceflight-related topics, and a lot of field trips for both survival training and as a base for Moon-specific instruction could follow. Frank was indifferent to the latter, he just "wanted to beat the Soviets to the Moon."

Deke Slayton, one of the Original Seven, did not fly a Mercury flight due to a medical condition he developed. Instead, NASA opted to assign him to be the Chief of Flight Crew Operations, meaning he, and he alone, would decide who would fly what and when. He wisely thought that Mercury veterans should command the first few Gemini flights, with a rookie from the Next Nine as a crewmate to gain actual Spaceflight experience. The first two numbered flights for Gemini were non-crewed test flights; Slayton slated Alan Shepard and Tom Stafford for *Gemini 3*, with Gus Grissom and Frank Borman as the back-up crew. NASA always had two full crews training for any given flight, so that if a prime crewperson for a flight could not make it for some reason, there would be a fully-trained and qualified person that could step in at a moment's notice. Each mission required extensive training, including items unique to that mission, and that took time. Slayton came up with a three-mission cycle plan: a back-up crew for a given mission would train in parallel with the prime crew, and then they would become the prime crew for the third mission after the one they backed up.

Al Shepard developed Ménière's disease, an inner ear disorder that could cause vertigo, which resulted in his being grounded. Gus and Frank would normally have moved up to be prime

crew for *Gemini 3*. As previously mentioned, Frank was a man of strong opinions. So was Gus, and he was the boss on this one. The Gemini capsule would not be big enough for both of them, and I don't mean physically. Gus ended up with John Young from the Next Nine instead.

The goal of Project Mercury was to learn how to put people in Low Earth Orbit. The purpose of Project Gemini was to develop the equipment, skills, and experience that would be needed for Project Apollo and the Moon landings. One of those was to demonstrate that a two-week Spaceflight was logistically feasible, something that Project Gemini planners originally had in mind for *Gemini 6*, but would slip to *Gemini 7*. Deke Slayton wanted Frank to fly the long mission in spite of the switcheroo on *Gemini 3*, so he assigned him as back-up on *Gemini 4*, with Jim Lovell as his back-up pilot.

### ***Gemini 7***

Apollo mission design required the ability for spacecraft to rendezvous and dock, something that was planned for testing on *Gemini 6*. A separate docking vehicle, Agena, was developed and would be launched a few hours ahead of *Gemini 6*, which would then approach and dock with it. Alas, when *Gemini 6* was ready to go, its Agena launch vehicle blew up soon after its launch. There was no replacement immediately available. *Gemini 7* was essentially complete, but two Gemini capsules were not capable of docking with one another. What to do?

It was time for another switcheroo. *Gemini 7* would be launched first, with Borman and Lovell, and the newly-renamed *Gemini 6A*, with Schirra and Stafford, would follow some time later and rendezvous with it. And that is just what they did. *Gemini 7* was launched on December 6, 1965, and *Gemini 6A* was launched on December 15. Rendezvous was accomplished successfully, and the two capsules maneuvered to within a foot of each other. Schirra, Stafford, and Lovell were all Annapolis grads and Schirra reminded Borman of that fact by holding up a hand-written sign in *Gemini 6A's* window for Borman's benefit. It read, "Beat Army!" Docking would have to wait for a future mission.

Three days after the rendezvous, it was time for *Gemini 7* to come back to Earth. Re-entry and pick up was routine. Borman was given NASA's Exceptional Service Medal, and he was promoted to full Colonel, the youngest of that rank in the entire Air Force at the time.

Slayton's rotation policy would have Borman command Gemini 13, but there were only 12 missions in the program, so it was on to Apollo for Frank!

### ***Apollo 8 – Part 1***

Deke Slayton thought out his Apollo crew assignments very carefully. He wanted the mission commanders (MCs) to be Spaceflight-experienced astronauts and the command module pilots (CMPs) to be as experienced as possible (since they would have to fly the Apollo capsule solo while the Moonwalkers were away). The lunar module pilots (LMPs) could be rookies.

Deke knew that his elegant plan would have to accommodate unforeseen circumstances, and it did. Gemini's rotation required revision, both for the loss of *Gemini 6's* Agena but also for the deaths of the *Gemini 9's* prime crew, Charles Bassett and Elliot See, in a plane crash at St. Louis, where they were going to visit with the Gemini capsule's prime contractor. Bassett had been Deke's selection for CMP on Frank's first Apollo flight and Bill Anders as his lunar module pilot

(or pilot, since that particular flight would be without the lunar module). Bassett's death caused Deke to assign Tom Stafford as CMP and Mike Collins as pilot. Stafford was later given his own crew, Collins moved up to CMP, and Bill Anders was re-assigned back to Frank's crew as pilot.

### **The Apollo 1 Fire**

January 27, 1967, was an awful day for NASA. Ed White's crew was conducting a series of tests in capsule AS-204, using a pure oxygen atmosphere at 15 PSI. What were they thinking?!? A spark from a faulty electrical connection blew into a raging inferno that killed Ed White, Gus Grissom, and Roger Chaffee. They had no chance at all of escape, and died a horrible death. [I clearly remember watching TV when the news interrupted the programming. It was like getting punched in the guts. These guys were my heroes. Arrrghhh!]

The entire manned Space program was put on hold. A review board was immediately established to determine the cause of the fire and recommending the engineering changes that would be required to ensure nothing like that could happen again. Only one astronaut was selected for the nine-member Board – Frank Borman. Congress got involved, too, and Frank testified testily at times in front of them. He was quite persuasive in convincing Congress that the Apollo system could be made safe(r). He told them, "We are trying to tell you that we are confident in our management, in our engineering, and in ourselves. I think the question is really: Are you confident in us?" After all, Frank and his colleagues were literally betting their lives on the program!

The Project Apollo manager resigned after the fire, and Frank was offered the job by Robert Gilruth, the Manned Spacecraft Center boss, but he turned it down. George Low, Gilruth's deputy, got the job. Borman was sent to North American Aviation, the Apollo capsule prime contractor, to oversee the implementation of the review board's recommendations.

Frank now had the clout to give his strong opinions sticking power, and he was not afraid to use it. First to fall before him was North American's chief of flight test, former *Dougllass Skyrocket* pilot (first to exceed Mach 2) and X-15 pilot, Scott Crossfield. They clashed famously, the upshot of which was Frank got his way and Scott got the highway. The hatch that had been the main obstacle to escape in the Apollo 1 fire had to be redesigned for rapid opening in an emergency, which added a lot of weight to the capsule, which required a lot of expensive engineering to accomplish. NASA Associate Administrator George Mueller pushed back on the quarter-million-dollar cost. Guess who won that one!

### ***Apollo 8* – Part 2**

Borman's crew initially had Michael Collins as CMP and Bill Anders as LMP. However, Collins suffered a back injury and had to be scrubbed from the crew, skipping a three-mission slot and ending up as CMP on *Apollo 11*. He was replaced by Frank's *Gemini 7* capsule mate, Jim Lovell.

The original Apollo plan had *Apollo 7* as a test of the Command/Service Module in Earth orbit. *Apollo 8* would be a test of the Lunar Module in Earth Orbit. *Apollo 9* would be a trip to the

Moon, orbit the Moon, then return to Earth. *Apollo 10* would be a full “dress rehearsal” with everything but the landing itself. *Apollo 11* would be the first landing.

The Lunar Module was a simple craft, but required a lot of innovative engineering. That took time. So much so that its non-availability was going to cause a delay in the *Apollo 8* schedule. That was not acceptable to NASA, because the CIA had gotten wind of an upcoming manned Russian mission to orbit the Moon, and everyone wanted NASA to be the first to do that.

The solution was to switch the missions of *Apollo 8* and *9*. Since the crews involved had been training for specific missions, they switched, too; Borman’s moving to *Apollo 8* and McDivitt’s moving to *Apollo 9*.

*Apollo 8* was launched without a hitch on December 21, 1968. Three more Apollo missions had to happen over the next seven months for Neil to make his “small step.”

Frank suffered a bout of motion sickness on the way to the Moon, but the trans-lunar injection, transfer orbit, and lunar orbit insertion went exactly as planned. They would make ten lunar orbits, taking twenty hours to do so, before firing the SM’s main engine and heading back to Earth. Those twenty hours were quite momentous!

I always find it difficult to explain what it was like in the 1960s to someone who hadn’t experienced that themselves. 1968 was a particularly bad year, with the assassinations of MLK and RFK, protests against the Viet Nam War, and more. People were pretty depressed about the World situation. But people were actually orbiting the Moon, in the Holiday season.

*Apollo 7* had carried the first TV camera into Space, capable of broadcasting to Earth live. *Apollo 8* had one, too. Borman was told that NASA planned for the *Apollo 8* crew to make a live television broadcast that would be carried by the networks, and that he as Mission Commander had to come up with something appropriate. Frank asked around a bit, and Joe Laitin, a former UPI reporter, suggested that the crew read from *Genesis*. Frank liked the idea, and that’s what they did. More than one commentator, and many in the general public, felt that the crew doing that “saved 1968.”

The Bible reading was certainly memorable, but it wasn’t the only positive outcome with the public in those twenty hours in lunar orbit. There were some very good cameras aboard, and Anders had been training in their use. NASA wanted quality images of potential landing sites and other surface features at higher resolution than possible from Earth. He got those pictures, but he also took a series of shots of the Earth and Moon together. One of them became known as the iconic shot “[Earthrise](#),” which helped spark the environmental movement, and help lead to the first observance of Earth Day, on April 22, 1970. It really put the smallness of our Island Earth in focus, spurring a lot of thought about how all Earth’s peoples are on a tiny lifeboat in the vast, vast Universe together.

The trip back to Earth was uneventful, but the splashdown was not. Departure after only ten orbits of the Moon would mean that *Apollo 8* would land well before dawn in the recovery area. Landing after sunup would require two additional orbits of the Moon, an idea that

Borman nixed. *Apollo 8's* command module landed near the recovery ship, the carrier *USS Yorktown*, but...

The conical shape of the Apollo command module meant that it would float stably cone-side-up, but also cone-side-down. Frank was a little slow in releasing the parachutes from the capsule immediately after splashdown, and the local wind pulled on them and flipped the capsule into the cone-side-down position. There were inflatable air bags that could right the capsule, but they took time to deploy. In the meantime, Frank had another bout with motion sickness. They returned from the *Yorktown* as popular heroes, in part because they were the first to orbit the Moon, but also for the Bible reading.

Deke Slayton was quite impressed with Borman's performance and leadership on *Gemini 7*, and after the *Apollo 1* disaster, he asked Frank to be the Mission Commander for *Apollo 11* and likely be the first man on the Moon. However, Frank had decided months prior that *Apollo 8* would be his final Spaceflight and he resolved to retire in 1970, so he declined.

He lived up to his plan, retiring from NASA in June, 1970. He retired from the Air Force at the same time, with the rank of Colonel.

## POST-NASA

Frank Borman had planned his post-retirement activities well. He had become a Special Advisor to Eastern Airlines more than a year before he retired from NASA, and completed an Advanced Management Program at Harvard's Business School just before he left government service. He became Eastern's Senior VP for Operations in December, 1972. Eastern had made some unfortunate purchases of aircraft prior to Frank's joining the company, and they would cause some financial grief on his watch. The first problem he faced was a crash of [Eastern Air Lines Flight 401](#) on December 29, 1972, a Lockheed L-1011 TriStar. Upon hearing of the crash, Frank jumped in a helicopter, found the crash site in the Everglades in the dark, and waded in waist-deep water to help rescue crash victims (How's that for a "hands-on" approach to management?!?). The L-1011 was not an economical aircraft to operate, and neither were the B727s in Eastern's fleet. When fuel costs skyrocketed in the mid-1970s, Eastern was in trouble.

Frank was appalled at the "top-heaviness" of Eastern's management team, and the many expensive perks to which they had become accustomed. He had been advancing up the senior management ladder and by the middle of 1975 he was President and CEO, and by the end of 1976 he was Chairman of Eastern's Board of Directors. He implemented serious cost-cutting measures, eliminated luxury company cars (he drove a second-hand Camaro himself, after rebuilding its engine), sold the company's executive jet, and banned the three-martini lunch.

Borman had slowed the financial bleeding with these and other management efforts, and while his actions helped greatly, they did not solve Eastern's financial woes. The airline industry was deregulated in 1978, resulting in a drastic lowering of fares. That was nice for the flying public, but caused financial losses throughout the system. Eastern could not survive, and was sold to Texas Air Corporation; Frank resigned his position in June, 1986.

Frank's retirement was busy. He moved to Las Cruces, New Mexico, and was on the Boards of a number of companies, including Home Depot and National Geographic. He purchased a cattle ranch in the Big Horn Mountains of Montana, and began running 4000 head of cattle. He also pursued his hobby of working on old airplanes. He bought and completely rebuilt a Bell P-63 King Cobra WWII-era fighter plane. He flew it in a number of air shows.

Susan Borman was in declining health, so the Bormans moved to Billings in 1998. She would pass on September 7, 2021. Frank died of a stroke on November 7, 2023, a mere two weeks ago.

## CODA

I personally witnessed a display of Frank's strong opinions. I don't recall the exact circumstance, but there was an event at the National Air and Space Museum not long after the flight of [Space Ship One](#) (the first crewed private Spaceflight in 2004). The craft was built by Burt Rutan and his company, Scaled Composites. The flight was quite an accomplishment, but what it did was about what the X-15 had done decades earlier.

The downtown building of the National Air and Space Museum is presently undergoing renovation. Its central gallery used to be the showcase for the most significant objects in NASM's collection: Lindbergh's *Spirit of St. Louis*, Yeager's *Glamorous Glennis*, John Glenn's Mercury capsule, the *Apollo 11* Command Module, and more. It will still be the showcase in the when building renovations are complete. The only aircraft with that level of importance that wasn't there was the *Wright Flyer*, but it had its *own* gallery, entirely devoted to it and the history of the Wright Brothers, and it has a special place again as renovation progresses.

*Space Ship One* was acquired by NASM and placed right in the middle of that august collection, right between Lindy's and Chuck's planes, above the famous capsules. It seemed to me and others that it was like putting a good Minor League player in Baseball's Hall of Fame. It seemed that way to Frank Borman, too. During the event's Q&A, he let everyone know, in no uncertain terms, of his displeasure at the exhibition of *Space Ship One* with arguably the most important artifacts of all of Aviation.

*Space Ship One* is a worthy object for NASM to have collected, no doubt. But I'm afraid I have to agree with Frank.

## REFERENCES

NASA Administrator Bill Nelson's Statement: <https://www.nasa.gov/news-release/nasa-administrator-honors-life-of-apollo-astronaut-frank-borman>

NASA: <https://www.nasa.gov/former-astronaut-frank-borman>

Frank Borman Oral History:

[https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral\\_histories/BormanF/Bormanff\\_4-13-99.htm](https://historycollection.jsc.nasa.gov/JSCHistoryPortal/history/oral_histories/BormanF/Bormanff_4-13-99.htm)



Academy of Model Aeronautics:

<https://www.modelaircraft.org/sites/default/files/BormanColFrank.pdf>

*Apollo 8* Astronauts reflections 50 years later (*Time Magazine*):

<https://time.com/5475697/apollo-8-50-years-later>

Borman, Frank, with Robert J. Serling, 1988, *Countdown: An Autobiography*, New York: Silver Arrow, ISBN 0-888-07929-6 [Has info about Borman's retirement decision on p 222-223]

Chaikin, Andrew, 1994, *A Man on the Moon*, New York: Penguin Books, ISBN 978-0-14-027201-7

Hacker, B.C. and J.M. Grimwood, 1977, *On the Shoulders of Titans: A History of Project Gemini*, [NASA SP-4203](#).

Jorgensen, Liisa, 2021, *Far Side of the Moon: Apollo 8 Commander Frank Borman and the Woman Who Gave Him Wings*, Chicago Review Press, ISBN 978-164-1606066

Russell, David Lee, 2013, *Eastern Air Lines: A History, 1926 – 1991*, ISBN 978-0-7864-7185-0

Slayton, Donald K., with Michael Cassutt, 1994, *Deke! U.S. Manned Space: From Mercury to the Shuttle*, New York: Forge, ISBN 978-0-312-85503-1

Last Edited on 19 November 2023

Copyright 2023 by Steven H. Williams  
Non-commercial educational use allowed