

## **Air and Space this Week**

### **Item of the Week**

## ***John Glenn***

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**KEY WORDS: John Glenn Project Mercury First American in Orbit Senator from Ohio Shuttle Mission Specialist**

*John Glenn was the quintessential All-American Hero. He gallantly served his country in WWII, and again in Korea, and again with NASA, and again in the U.S. Senate, and one last time, again with NASA. He was an inspiration to us all!*

*The 60<sup>th</sup> anniversary of his becoming the first American to orbit the Earth is coming up on February 20. I'm making him the subject of an Item of the Week a little early because I figure that getting info about him out to the community now will help everyone explain just how important his accomplishments were when the media commemorates his work on that day.*

### **BOYHOOD**

John Herschel Glenn, Jr. was born on July 18, 1921, in Cambridge, Ohio. His father was a WWI soldier in the American Expeditionary Force and afterward started a family and a plumbing business in nearby New Concord, Ohio. Young John enjoyed an "All-American"-type boyhood of the day, complete with a paper route, scouting, and other such pursuits. Three things dominated his early education: an intense interest in flying, sparked when he was 8 years old by an airplane flight with his dad; sports (he lettered in football (he played both ways), basketball, and tennis); and his friendship with the "Girl Next Door," one Anna Margaret Castor.

Glenn graduated from high school in 1939, then studied chemistry and played football at Muskingum College. He enrolled in the Civilian Pilot Training Program in 1941, earning a private pilot's license. He was a few requirements short of graduation when Pearl Harbor was attacked. He immediately quit school and put in his enlistment papers for the U.S. Army Air Corps.

### **COMBAT PILOT AND FLIGHT TEST**

The USAAC must have been flooded with enlistments or something, because they took no action on Glenn's request. He wanted to serve and he wanted to fly, so he enlisted in the U.S. Navy as an aviation cadet in March, 1942. They sent him to the flight school at the University of Iowa and then to Naval Air Station Olathe for training. Advanced training was at Corpus Christi, where Glenn accepted an offer to transfer over to the Marines. He was commissioned as a

second lieutenant in March, 1943. He married Annie Castor a few weeks later. After a short stint of advanced training, Glenn was assigned to Marine Squadron VMJ-353 at Camp Kearny, California, where he would fly R4D transport planes (the C-47 in the Army – the military version of the DC-3).

John Glenn did not want to spend the War flying a cargo plane; he wanted to fly fighters. There was also a fighter squadron stationed at Kearny, equipped with the Grumman F4F Wildcat. Glenn went to visit its CO, and ended up with a transfer. The squadron was moved immediately thereafter to El Centro, and their mounts were upgraded to the F4U Corsair. He was promoted and his squadron was sent to Midway Island in February, 1944, then to the Marshall Islands in June, where he flew a total of 57 combat missions, earning two DFCs in the process. He was based for a time at Majuro, from which he flew flak suppression missions over Maloelap and a few escort missions for bombers attacking the important phosphate plants on Nauru Island. After Majuro, his unit was based at least part of the time at Roi-Namur, an important island pair in the Kwajalein atoll, the largest atoll in the world. Most of his fighting was against ground targets in the nearby islets, strafing and dropping napalm. His aircraft was hit by ground fire on five different occasions, including one hit on a wing that damaged his ability to steer the aircraft.

Glenn's WWII combat tour was over, and he returned to the ZI for assignments at Cherry Point and Patuxent River, wrapped around a promotion to captain and receiving a regular commission. He then volunteered for a stint in the occupation of North China in 1946-47, where he flew a number of patrol missions. His next duty assignments were at Corpus Christi, where he was a flight instructor, followed by Quantico for a six-month course, and then service on the staff of the Commandant of Marine Schools. Somebody obviously had recognized Glenn's superior qualities!

The American armed forces were transitioning from propeller-driven aircraft to jets in the early time just before the Korean Conflict, and Glenn knew he had to make the transition, too, which he did in mid-1952. Part of his preparation included an application to fly the F-86 Sabre fighter in an exchange program with the Air Force. Off he went to South Korea on February 3, 1953, where he was assigned to be the operations officer for VMF-311, filled with other applicant pilots to the exchange program. Until the exchange was finalized, VMF-311 would be flying the F9F Panther jet fighter/bomber. Glenn would be flying ground support and reconnaissance missions rather than jet-to-jet combat. But those kinds of missions were dangerous, too.

Glenn's first Korean combat flight was on February 26, 1953. It was an uneventful reconnaissance job. He would go on and fly 62 more combat missions over Korea. On one of them, a 90mm anti-aircraft shell blew off part of his wing, but he made it back to base OK with some difficulty. Another time he took a 37mm AAA round in the tail and still got back OK; had it been a 90mm, it would have taken his tail clean off and he'd have been killed in a fiery crash. His buddies, including his sometimes-wingman, baseball HoF great Ted Williams, got to giving him a lot of flak by calling him "Old Magnet Ass" because he collected so much flak (the real kind). He deeply impressed his fellow pilots and superiors with his skill and courage. Williams was exceptionally effusive with his praise.

The exchange came through, and Glenn moved over to the USAF 25<sup>th</sup> Fighter-Interceptor Squadron, where he would finally get a crack at the F-86. He'd be patrolling "MiG Alley" and would likely face the MiG-15 in combat (for other aspects of this phase of the Conflict, see [here](#)).

Glenn would fly a total of 27 combat missions in the F-86. He shot down three MiG-15s in action, the last just a few days before the Armistice took effect. He was awarded two more DFCs in the process (bring his total of four), and a slew of other medals and decorations.

Glenn had known that the Korean Conflict would be ending soon when he got his first combat victory. He really liked aviation engineering and high-speed flight, so he put in for the U.S. Naval Test Pilot School at Patuxent while he was still in Korea. He was accepted, and enrolled there in January, 1954. He tested a variety of high-performance aircraft, and had one close call that almost killed him. His work ethic and coolness under fire, and his growing capabilities with the engineering side of flight test, led to his assignment to the Naval Fighter Design Branch at the Navy's Bureau of Aeronautics, where he received advanced education and worked with the new F8U Crusader aircraft.

Glenn still loved high-speed flight, and he had been learning a bit about persuasion and publicity. He wanted to showcase the Crusader's capabilities, and turned to one of the old-time indicators of aircraft prowess, [trans-continental flight](#). He carefully studied the speed, range, and other characteristics of the Crusader and determined that it could set a record flight time for coast-to-coast travel, even if it would require three aerial refuelings.

The Crusader's maximum speed was just barely super-sonic, but it was still 586 MPH, faster than the muzzle speed of a .45 caliber bullet. Glenn therefore dubbed his Crusader "The Flying Bullet" and set out to set an intercontinental speed record. On July 16, 1957, he flew from Los Alamitos, California to Floyd Bennett Field on Long Island in 3 hours, 23 minutes, and 8.3 seconds. The record, the plane's cool name, and the fact that Glenn took a continuous movie from the cockpit for the entire flight generated LOTS of publicity, and a fifth DFC for Glenn. The *New York Times* did a piece on him, and he appeared on at least one TV game show ("Name That Tune").

Glenn was now 36 years old, and even though he had a lot of flying and combat experience, he realized that he was getting too old for flight testing the latest aircraft. What to do, what to do?

## **PROJECT MERCURY and the *FRIENDSHIP 7***

The [launch of Sputnik 1](#) on October 4, 1957, provided an answer. In short order, President Eisenhower turned NACA into NASA and instituted a number of programs that would enhance America's educational and technological capabilities. One of NASA's first objectives, putting an American in Earth orbit, was planned for under Project Mercury, which would require a lot of research into both the equipment and the pilots before success could happen.

Glenn was still at the Bureau of Aeronautics, which give him additional information on the progress of America's push toward Space. His office was ordered to provide a test pilot for duty at Langley Air Force Base, both to make runs on a new spaceflight simulator there and to work with the Naval Air Development Center in Johnstown, Pennsylvania, where NASA had just built a high-speed centrifuge where they could evaluate that test pilot's responses to high-g situations. Would it surprise you to learn that Glenn immediately volunteered himself for this assignment?

America's first "astronauts" would need to have a solid background in aeronautical/aerospace engineering, and be absolutely rock-steady under the intense stress of this most-experimental flight. Eisenhower directed NASA, therefore, to recruit a cadre of astronauts for the Mercury program from the ranks on military test pilots exclusively. At that point, a total of only 508 men had graduated from a service flight test school program, and of those, only 110 matched all of the minimum requirements, including a firm upper limit of 5'11" in height. Glenn barely qualified; he was approaching 40 and did not have a formal advanced engineering degree. But he had support from his test pilot school CO, who went to NASA HQ to lobby on Glenn's behalf. That got him through the "first cut" – now there were 68 candidates left.

Glenn had the results from his testing of the centrifuge at Johnstown in hand when he interviewed with the associate director of Project Mercury, Charles Donlan. His record was clearly impressive, and Donlan asked around a bit, and found that Glenn was working after hours to study the schematics of the various designs of the Mercury capsule. These efforts allowed him to make the second cut, now 32 candidates. The next step was passing a series of grueling medical exams and physical tests, soon-to-be the stuff of legends among the early astronauts. Many candidates detested the aggressive tests, but Glenn (and Carpenter) thrived under them. Operation in Space was a big unknown, and astronauts had to be able to function correctly, so Space biomedicine was a high-priority item among those making final astronaut picks. Glenn's attitude on such things, and his "strength of personality and his dedication," were strong marks in his favor. Many test pilots had a major "devil-may-care" attitude toward flying, wine, women, and song, but John Glenn was Jack Armstrong, All-American boy, and a very Straight Arrow.

And, of course, he was one of the seven men picked for Project Mercury. They were announced to the public in a news conference on April 9, 1959. A reporter yelled out a question, "Which of you are ready to go to Space?" Six of the seven raised their hand. John Glenn raised both of his.

Public attention to the Seven was intense, and *Life Magazine*, a very big deal in those days, rode the publicity wave. This was the early 1960s; there were only three national TV networks, no color TV, no transistor radio, no digital much of anything, and the only remote telephone available cost thousands and required about a cubic yard of equipment. But everyone read a newspaper and everyone read *Life*. If you didn't live through it, and even if you did, check out Tom Wolfe's *The Right Stuff* to get (remember) the feel of the halcyon times for test pilots and astronauts in the early 60s.

The early 1960s might have been exciting for some, but they were a dangerous and trying time for others. The Cold War was at its height, we came close to nuclear Armageddon over the Cuban Missile Crisis, and school kids were being taught to “duck and cover” when the bombs fell. The power of nuclear weapons made all-out war unwinnable, so the emphasis was placed on winning the hearts and minds of non-aligned people. To many Americans, we were reverting to a much earlier form of combat, where the very best combatants fought rather than vast armies. Astronauts and cosmonauts were the gallant knights in the symbolic battle in the sky. No wonder they were lionized as the heroes they were.

Test pilots are by their very nature highly competitive individuals. Physical tests were one such battleground, but the big one was, who was going to be the first of the seven to fly? Major egos were involved... The choices made by NASA management would have Alan Shepard make the first astronaut flight, a sub-orbital hop atop the pretty-much-the-same Redstone missile that had launched *Explorer 1*. Gus Grissom would be second, also a Redstone sub-orbital trip. The much more powerful Atlas missile would power the rest of the missions of the Mercury program. John Glenn was selected to fly the first of those and become the first American to orbit the Earth. Deke Slayton would follow with another. And the rest.

Glenn was deeply disappointed at not being selected for the first flight, but in retrospect, being the first to orbit turned out to be a much bigger deal than the first to fly on a rocket. The “consolation prize” of serving as back-up pilot for both Shepard and Grissom was a duty he executed well, but it wasn’t what he had wanted.

The public was wondering if the United States had caught up with the Russians. There had been a couple of glitches recently, including one where the rocket testing a full-up version of the Mercury capsule fired briefly, and then just sat there on the pad. The capsule went through its planned re-entry sequence, and detected air pressure high enough to make the parachute work, so the escape rocket jettisoned and the parachute deployed, draped over the impotent rocket.

Planning for Shepard’s launch in May, 1961, proceeded apace. And then....

The Russians launched *Vostok 1* on April 12. Not only was it a larger satellite than *Sputnik 2*, it carried a cosmonaut! Yuri Gagarin made a full orbit of the Earth, the first human to do so.

This was an enormous propaganda coup for the USSR, and an enormous black eye on USA national pride and prestige. The Russians beat the Americans, not only to Space, but to Earth orbit. Even if Shepard’s and Grissom’s flights went perfectly, they still wouldn’t match Gagarin’s accomplishment.

Everyone wondered, **could** the USA catch up?

Well, Shepard’s and Grissom’s flights did go (almost) as planned, if one overlooks that whole escape-hatch-blowing-prematurely-and-Gus-almost-drowning thing.

Then the Russian put another thumb in Uncle Sam’s eye when they launched another man into Space on August 6, 1961. Gherman Titov made 17 orbits of the Earth, and was aloft for over a day (puking all the way – he was the first astro/cosmonaut to suffer from Space sickness).

Glenn had been busy all this time with training. In addition, each Mercury astronaut had one aspect of the flight to focus on, and help with its development. Glenn's was cockpit design and functionality. He would similarly assist with the cockpit design of the Apollo capsule, later.

After a series of necessary technical and weather delays, the big day finally came. On **February 20, 1962**, sixty years ago next week, John Glenn and *Friendship 7* were launched at 9:47 AM ET.

The flight itself proved relatively uneventful, apart from a whimsical observation and a scare caused by a faulty sensor. Glenn was very busy the entire time conducting equipment tests and small-scale experiments. There was little room for him to really do much in the cockpit. It was so cramped that the astronauts referred to "wearing" the capsule rather than occupying it! He did look outside a little bit, and noticed that there were some odd lights that seemed to be flying in formation with him. He couldn't tell if they were big and far away or small and close by; he referred to them as "fireflies." About the only thing he could learn in the limited time he had to think about them was that if he hit the side of the capsule with his fist, it would produce a bunch of fireflies. Ergo, they were small and close. [Mercury astronauts later figured out that the fireflies were frozen crystals of urine vented from the capsule, catching the sunlight. So much for capsule-following UFOs! One of the astronauts, in a waggish mood, called Glenn's discovery "Constellation Orion."]

The other problem was much more serious. Near the end of his first (of three) orbits, ground control saw telemetry that indicated that the heat shield of the capsule was loose. The heat shield was designed to be firmly connected to the capsule during the actual reentry, then detach after the capsule's parachute deployed. The heat shield would become the lower end of a bag-like structure that would cushion the impact of the capsule with the surface of the sea. But if the heat shield had detached prematurely, it could shift out of position and the re-entry heat would torch the capsule, along with astronaut Glenn. There was no warning signal of this problem in the capsule itself, but Glenn quickly figured out there was a problem from the questions ground control started asking.

If the signal the ground received was true, there was little that could be done about the situation. Repair in Space or a rescue was simply not possible. Ground control analyzed the possible courses of action, and informed Glenn of the situation and offered only one "remedy." The Mercury capsule had a package of retrorockets placed in the center of the heat shield, held in place by three cables connecting the package to the capsule's sides. Normally, the whole package would be jettisoned after the retros had fired but before the re-entry began. Ground suggested that the retros NOT be jettisoned, in the hopes that, if the heat shield really was loose, the cables would be strong enough to hold the heat shield in place.

Glenn complied, and saw a number of flaming chunks of the retro package fly by his window. The package being in place also caused a more turbulent ride than expected. But the fault lay in the sensor, not the heat shield mounting, and John Glenn splashed down safely in the South Atlantic after three full orbits, a 295-minute flight.

Glenn became a National Hero. He met with JFK and received a ticker-tape parade in New York that eclipsed that given Charles Lindbergh. He received his sixth DFC, and a Congressional Space Medal of Honor.

But he was unlikely to fly in Space again. As a National Hero, he was too valuable a symbol to be further risked. But as a National Hero, he would make an attractive political candidate, at least according to Robert F. Kennedy. Glenn thought it over, and thought he could make a successful run as a Democratic Senate candidate in his native Ohio in the 1964 elections for the seat held by Robert Taft, Jr.

Glenn resigned from NASA on January 16, 1964. His flight status, and his nascent candidacy, was further in jeopardy because of a fall he took in a hotel room, which gave him a concussion and damaged his middle ear. He was unable to campaign, and dropped out of the Senate race.

Deke Slayton had a heart irregularity that had first been detected while he in the centrifuge trainer in 1959. It was an idiopathic atrial fibrillation, but deemed not severe enough for him to be taken off flight status. The health requirements for astronauts, however, was much more stringent than those for pilots, and Deke was medically disqualified from spaceflight on March 15, 1962. Scott Carpenter would replace him on the next Mercury flight, MA-7.

Carpenter's flight would not go well. He was never in danger, but he was distracted by the sensations of spaceflight and the view, burned up a lot of his attitude-control fuel prematurely and failed to complete his busy schedule. He overshot his landing area significantly, and it was touch and go for a few minutes on whether he would be recovered safely.

Wally Schirra was next, and he proved to be a very competent capsule test pilot. He would get the shakedown nod in both the Gemini and Apollo programs. He was on the back-up crew for *Gemini 3*, but got moved to *Gemini 6*. He also flew the first manned Apollo mission, checking out the *Apollo 7* capsule in Earth orbit.

Last of the seven was Gordon Cooper. He flew 22 orbits on the final Mercury mission, coping with a series of troublesome malfunctions. He also was the command pilot of *Gemini 5*.

## SENATOR GLENN

John Glenn retired from the Marine Corps on January 1, 1965, with the rank of full colonel. Glenn decided to go into business and was hired by RC Cola (remember that?) as both the VP of corporate development and a member of RC's board of directors. He would later become the president of RC International. But he had not given up on his political aspirations.

Glenn was close to the Kennedy family, especially RFK. He was in RFK's suite when he won the California Democratic Presidential primary in 1968, remaining there while RFK went downstairs to greet supporters and was murdered. Glenn and Annie would escort RFK's children that were there back home, and John served as one of RFK's pallbearers.

Glenn entered the Democratic primary for Ohio in 1970. Howard Metzenbaum out-spent him 4-1, but Glenn lost by a slim 51-49% margin. Metzenbaum went on to lose the Senate election to Taft. Glenn had a lot to learn about large-scale political runs, but he was a "quick study."

Glenn would remain active in Ohio politics for the next four years, serving some of that time on the Citizens Task Force on Environmental Protection. Hmmm.. First Earth Day + Environment + National Hero = Senate seat. Maybe.

One of the Ohio Senators, William Saxbe, was appointed U.S Attorney General in the wake of the Watergate scandal, creating an open seat that Metzenbaum and Glenn both wanted. Ohio governor John Gilligan would appoint Saxbe's successor for the brief rest of Saxbe's term, which would run to 1974. For a variety of political reasons, Metzenbaum got the nod.

John Glenn was an even-tempered man, but Metzenbaum had really pissed him off during their 1970 primary fight, when Howard accused Glenn of never holding a payroll or a "real job." [It makes me mad even to write this, even after both of them are dead and the slight was over 50 years ago!] Glenn chose to primary Metzenbaum, and absolutely ripped Howard to shreds with a speech that came to be known as the "Gold Stars Mother" speech. In it, he challenged Metzenbaum to *"go to a veterans' hospital and look those men with mangled bodies in the eyes and tell them they didn't hold a job. You go with me to any Gold Star mother and you look her in the eye and tell her that her son did not hold a job."* Ka-boom!

Glenn whopped incumbent Metzenbaum in the primary and then won the general. He would serve four terms in the Senate, retiring in 1999.

NACA had built a facility near Cleveland during WWII for conducting research on propellers and other aviation technology. The name of the facility changed after WWII from the NACA Aircraft Engine Research Laboratory to the NACA Flight Propulsion Research Laboratory, a reflection of its newer focus on jet engines. In 1948, it was named the Lewis Research Center to honor George W. Lewis, an aircraft propulsion specialist and NACA's retiring Director of Aeronautical Research. The name was changed once again in 1999 to the Glenn Research Center, when John Glenn retired from the Senate.

I had the pleasure of visiting the GRC in 2012, when I had an outreach gig there for the last Transit of Venus in our lifetimes. My hosts were gracious, the presentations at Glenn and at the Great Lakes Science Center on the shore of Lake Erie went well, and I got a pleasant tour of the GRC facility. I really enjoyed seeing, and smelling (!), some of the labs dating back 50+ years (nothing else smells quite like an old school aero lab), and their latest work in Venus exploration technology. The sky even cleared up just in time to see the Transit!

John Glenn gallantly served his country in WWII, and again in Korea, and again with NASA, and yet again, in the Senate. But his illustrious career had one more highlight left!

## RETURN TO ORBIT

John Glenn performed one final service for NASA. He would return to Space! Doctors wanted to know more about the effects of spaceflight on the human body, and John Glenn was an excellent subject. He lobbied for the flight, realizing that many of the ways aging affects the human body were similar to the effects of spaceflight. The extensive medical testing and record-keeping Glenn and his Mercury counterparts underwent in the early 1960s gave doctors a basis for comparison with new medical data from his flight on a 1998 Shuttle mission, STS-95



(*Discovery*). A lot had changed since 1962! But one thing hadn't. NASA Administrator Dan Goldin OK'd Glenn's flight with one proviso; Glenn had to pass the same pre-flight physical that all the other astronauts had to pass. No surprise that he passed the physical with flying colors! Glenn served as a payload specialist on the nine-day mission. He performed a number of medical measurements and experiments on himself in a SpaceHab module, and helped with the deployment of the Spartan 201-5 free-flyer that would make a number of measurements of the Sun, a test platform for the *Hubble Space Telescope*, and several microgravity experiments developed at Lewis Research Center, which would bear his name within a year.

At the time, the 77-year-old Glenn was the oldest person to have ever flown in Space. Since then, both Wally Funk and William Shatner have made it into Space (barely), both on novelty sub-orbital private trips. Glenn is still the oldest person to have ever orbited the Earth. He also became the second U.S. Senator to fly on the Shuttle, following Jake Garn of Utah on STS-51D. Bill Nelson, then a member of the House and now the NASA Administrator, also flew a Shuttle mission (STS-61-C), and after that became a Senator.

Both *Friendship 7* and *Discovery* are in the collection of the National Air and Space Museum. *Friendship 7* has been on display in the Milestones of Flight gallery (the "all-star" part of NASM) for many years and will be there again after the ongoing renovation is complete. The *Discovery* has been on display in the NASM Udvar-Hazy Center since it was decommissioned.

The one thing that John Glenn valued most in his life, in addition to his devotion to his country, was his love and devotion to his wife and boyhood chum, Annie. The dedication in his autobiography is "For Annie, always and forever 'the wind beneath my wings.'" His protection of her was legendary; he once faced down LBJ over interviewing her when she didn't want to talk with him (or anyone) and made it stick. She was shy about her stutter, and would become a strong advocate for raising awareness about speaking difficulties and would become an adjunct professor at The Ohio State University in the Speech Pathology Department.

John Glenn passed away on December 8, 2018. Annie would follow, tragically due to COVID, on May 19, 2020, at age 100.

## CODA

I have told a version of the following story before, so please forgive me if it sounds familiar. During the course of my duties at the Smithsonian National Air and Space Museum I got to interact with a fair number of well-known people who have "been there and done that." The Museum had an annual lecture series named for Glenn, and he would show up from time to time for various reasons. Any time he made a public appearance, NASM knew with absolute certainty that there would be an SRO crowd, and provisions for overflow would be needed.

It was a hard, if unwritten, rule that staff members should never approach a VIP guest and bother them in any way for a picture, autograph, etc. I followed that edict religiously, except for the one time I deliberately broke it.

My father was suffering from the Alzheimer's that would soon kill him. John Glenn was one of my dad's biggest heroes. So when I found myself next to Senator Glenn in a quiet moment during an evening event, I grabbed an event program off my table, approached him, and said, "I know this is really against protocol, and I would never, ever do this for myself. But my father is in bad health, and you are one of his greatest heroes. It would mean the world to him if you would autograph this program to him."

Shades of the [kindness shown me by Alan Bean](#)! The Senator smiled and asked me my father's name. He then wrote out with a flourish, "To Ben, from John Glenn, with Best Wishes." I thanked him profusely, and beat a hasty retreat, clutching the precious program. I took it with me to my parent's home on my next visit. Pop was struggling, but after I showed him the program and explained it to him a few times, he got it. He stared at the words the Senator wrote, **to him**, for several moments. Then a tear filled his eye. It was probably the last new thing he ever knew.

I never saw my Dad cry before, and I never saw him cry again. Pardon me for a moment, I seem to have something in my eye....

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