

From the earliest days of the space program, USAF has supplied top space operators.

Air Force Astronauts



Project Mercury astronauts (l-r): Lt. Scott Carpenter, Capt. Gordon Cooper Jr., Lt. Col. John Glenn Jr., Capt. Virgil Grissom, Lt. Cmdr. Walter Schirra Jr., Lt. Cmdr. Alan Shepard Jr., and Capt. Deke Slayton. Cooper, Grissom, and Slayton were all active duty USAF airmen.

In the early 1960s, seven Americans gained immortality as the first US astronauts in the Mercury program. Three were from the active duty Air Force: Capt. Virgil I. “Gus” Grissom, Capt. Donald K. “Deke” Slayton, and Maj. L. Gordon Cooper Jr.

These were the first of more than 80 Air Force astronauts to participate in

By Walter J. Boyne



the Mercury and succeeding Gemini, Apollo, Skylab, Apollo-Soyuz, space shuttle, and International Space Station missions. Their collective achievements did not come without sacrifice. Of the 27 NASA astronauts who have died during their time in the space program, eight came from the Air Force.

The National Aeronautics and Space Administration was created on Oct. 1, 1958. NASA was formed from the former National Advisory Committee for Aeronautics, which transferred its facilities, personnel, equipment, and advisory committees.

Yet NASA had a clearer and much more broadly defined charter than NACA, for it was the US response to the incredible space accomplishments of the Soviet Union.

Only six days after NASA’s formation, it announced Project Mercury, with the objective of placing a manned spacecraft into orbit around the Earth. The initial criteria for selection as a Mercury astronaut were as follows:

- Less than 40 years of age
- Height not greater than 5 feet 11 inches
- Excellent physical condition
- Bachelor’s degree or equivalent
- 1,500 hours total flying time
- Graduate of a test pilot school
- Qualified jet aircraft pilot

Over the years, these criteria would be modified as circumstance required and as scientific demands increased.

The Mercury missions were to investigate human reactions and capabilities in the strange new environment of space, with the fundamental premise that the spacecraft and pilot were to be recovered safely.

The Gemini missions were to learn how to maneuver a spacecraft in orbit so as to be able to rendezvous and dock with other vehicles. The Gemini missions also featured the first American extravehicular activities (EVAs), which would be required for lunar surface exploration.

The Apollo missions were to fulfill President Kennedy’s challenge, to place a man on the moon by the end of the 1960s, by using the lunar orbital rendezvous (LOR) technique. This called for a spacecraft to be launched from the Earth to the moon, then enter an orbit around the moon and separate into a command module and a lunar module. The latter would touch down on the moon’s surface with two astronauts. A third astronaut would continue to orbit the moon in the command module.

After exploring the surface, astronauts would re-enter the lunar module, then rejoin their colleague in the command module for the trip home.

All three of the programs were fraught with technical risk, but provided the only apparent means to beat the Soviets to a moon landing. And all three were tremendously successful, thanks in great part to the contributions of the Air Force astronauts.

While it is perilous to single out individual astronauts for acclaim, in each program there were those who distinguished themselves by daring feats of skill and courage—or by some chance element of fate.

First among the notable astronauts is Capt. Virgil I. “Gus” Grissom. Flying the Liberty Bell 7 spacecraft, Grissom entered the history books on the second and final Mercury suborbital flight on July 21, 1961. He entered legend when the hatch popped open on the spacecraft on splashdown. Grissom was rescued from the water, but the capsule sank 15,000 feet into the Atlantic, not to be recovered until 38 years later.

A tough fighter pilot who had flown 100 missions in F-86s in Korea, Grissom became dominant in the design of the Gemini spacecraft at the contractor’s plant and was the first person to complete two flights into space.

Flying with NASA civilian John W. Young in 1965, Grissom exercised complete control of the spacecraft in a convincing demonstration that the problem of altering orbit in flight was solved.

After serving as a backup pilot on Gemini 6, Grissom was selected as the command pilot for the first Apollo flight. Intensely involved in the Apollo program, Grissom was one of three men killed in the tragic Jan. 27, 1967 flash fire in Apollo 1, during a launchpad test.

Air Force Lt. Col. Edward H. White II and Lt. Cmdr. Roger B. Chaffee also died in the disaster. White had previously made the first American space walk, on Gemini 4 in June 1965.

The Gemini program produced an astounding array of feats from Air Force astronauts, from White’s dramatic EVA to Cooper’s masterful handling of a long series of emergencies on Gemini 5.

Buzz Aldrin is notable for his intensive planning and execution. Aldrin, now a USAF retired colonel, had helped solve the problem of how to train for walking and working in the free fall of Earth orbit by suggesting training in a swimming pool. The practice sessions



Apollo 1 astronauts (l-r): Capt. Virgil Grissom, Lt. Col. Edward White, and Lt. Cmdr. Roger Chaffee. All three men were killed in a Jan. 27, 1967 fire that broke out in their capsule during a launchpad test.

served him well when Gemini 12, the last mission of the series, was launched on Nov. 11, 1966 with command pilot Navy Capt. James A. Lovell Jr.

Aldrin's mathematical skills came into play when charts of his own making were used to guide his spacecraft to a rendezvous with the Agena target vehicle. The previous American record for an EVA had been held by Navy Capt. Eugene A. Cernan, who on the Gemini 9 flight set a record two-hour, 10-minute space walk.

Aldrin executed a record EVA of five hours, 30 minutes and, thanks to his pool training, did it with little sign of physical stress. NASA subsequently built a huge weightless environment training facility to train its shuttle EVA crews.

Thirty astronauts would participate in Apollo flights, and about half were from the Air Force.

Similarly, of the 12 men who walked on the moon, four wore USAF wings—Aldrin, retired Col. David R. Scott, retired Col. James B. Irwin, and retired Brig. Gen. Charles M. Duke Jr.

Each of the Apollo flights was significant, but the most famous was the July 1969 Apollo 11 mission, in which two Air Force astronauts, Aldrin and Michael Collins, participated.

Neil A. Armstrong, a NASA civilian astronaut and Navy veteran, was the Apollo 11 mission commander and the first man to set foot on the moon. He was followed on the lunar surface by Aldrin, while Collins orbited the moon above them.

NASA saw a requirement for more

astronauts and in 1965 selected a new breed, called "scientist-astronauts," to join the ranks of astronaut aspirants. The disciplines most needed were geology, geophysics, medicine, and physiology.

The selection criteria no longer included being a test pilot. Scientists who were not qualified pilots were to be taught to fly after they joined the program. More than 1,000 applications were received, and in June 1965, NASA announced that six were selected. Of these, two had Air Force ties: Duane E. Graveline, who was still on active duty with the Air Force, and F. Curtis Michel, a former USAF

member. They were the first of many more scientist-astronauts to come from Air Force ranks.

As the astronaut program expanded and qualities other than those possessed only by test pilots were needed, the astronaut corps included a dazzling variety of skills and talents. Thus, while military jet aircraft pilots are still best suited to actually fly the space shuttle through its complete mission, equally challenging scientific tasks can be handled by mission specialists who do experiments, manage the shuttle's robot arm, conduct extravehicular activities, and more.

The first non-test pilot astronaut was NASA civilian Russell L. "Rusty" Schweickart, who flew on Apollo 9, and the first non-test pilot scientist-astronaut to venture into space was NASA civilian Harrison H. Schmitt, the lunar module pilot on Apollo 17, the last flight of the series.

Astronaut-scientists were members of each of the crews of the three manned Skylab missions. This early space station, coming on the heels of Apollo, was never fully appreciated and never captured the public's imagination as the moon flights did.

William R. Pogue, an Air Force veteran of F-84 combat in Korea, added to his career on the third manned Skylab mission. As pilot, Pogue, with Gerald P. Carr (USMC) and civilian astronaut-scientist Edward G. Gibson, guided the Skylab crew through 1,214 Earth orbits and four EVAs.

In July 1975, the possibility of political detente was signaled when an Apollo



Air Force Col. Eileen Collins sits in the cockpit of the Shuttle Training Aircraft at NASA's Kennedy Space Center. Collins, who retired in 2005, was the first female pilot and commander of a space shuttle.

spacecraft docked with a Soviet Soyuz spacecraft.

The Apollo was commanded by an Air Force space veteran, Thomas P. Stafford. Selected among the second group of astronauts in September 1962, he made his first spaceflight aboard Gemini 6 in December 1965. The following June, he commanded Gemini 9, demonstrating an early rendezvous technique that would be used in the Apollo program. Stafford commanded Apollo 10 in May 1969 and flew a test flight within 10 miles of the moon's surface. The Apollo-Soyuz mission was his last spaceflight—and the first meeting in space of American astronauts and Soviet cosmonauts.

Deke Slayton, who had to drop out from the Mercury program because of a heart condition, made his first spaceflight as the Apollo docking pilot on this mission.

Despite—or perhaps because of—this rapid succession of achievements, the American public was becoming sated with space triumphs. The knowledge that the Soviet Union already possessed a powerful intercontinental ballistic missile force simultaneously made its space effort seem less threatening.

There was also a change of pace within the astronaut program. Where the Mercury astronauts went from selection to



Guion Bluford Jr., pictured here onboard the STS-8 Challenger, exercises on a treadmill while restrained by harness. As an Air Force lieutenant colonel, Bluford was the first African-American astronaut to fly in space.

flight in less than three years, astronauts for the later missions had to look forward to long and unspecified delays before being assigned to a flight crew.

The delays often lasted many years, and astronaut aspirants stayed busy with training and with work as a backup or support crew member. It took even more motivation to be dedicated to the cause

of being an astronaut, because it was uncertain that the final goal, a flight in space, would ever be reached.

In their memoirs, the early astronauts attribute their desire to fly in space to many causes, but the common denominator seems to be a driving urge to explore, to raise the limits of human capability, and to be on the forefront of both American science and defense.

Astronauts who came into the program later, while often feeling the same sentiments, were also inspired by those who had gone before.

The early enthusiasm for the space program masked the fact that becoming an astronaut was not necessarily a career enhancing move. The very nature of the astronaut program took its members outside the normal Air Force career progression path, particularly in wartime.

There were other dissatisfactions. The demand on the astronaut's time was great, and the families sometimes suffered when the astronaut was away on lengthy temporary tours of duty. Offsetting this was the comfort derived from the stability of a NASA job in Houston, in contrast to the constant moves of the typical Air Force family.

Compensation was another consideration. Active duty officers received their normal pay while on detached duty to NASA. Everyone entering the astronaut program knew in advance that the pay was far from that which might be earned in comparable work in academia or in industry. Nonetheless, when family emergencies arose, or when their

A Sample of the Airmen in NASA

Sputnik's first surprise beep from orbit on Oct. 4, 1957 began a dismal period of playing catch-up for the United States. The USSR's lead in the space race reached its zenith on April 12, 1961 when cosmonaut Yuri Gagarin flew his Vostok 1 spacecraft on the first manned orbital flight in history.

The Kennedy Administration and Congress sensed the American public's demand to win the space race and opened the nation's coffers to a vigorous, expanded NASA. Air Force personnel would—and continue to—play starring roles.

Twenty-nine astronauts now working for NASA have former ties with or are currently members of the Air Force, and like their predecessors, they are highly qualified. Following is a cross section of a few of the many airmen made available to NASA:

* Col. Lee J. Archambault is a veteran of 22 combat missions in the F-117A during Operation Desert Storm. Archambault entered astronaut training in August 1998 and has since supported launch operations and served as capsule communicator.

* Col. Michael J. Bloomfield was an honor graduate of USAF Test Pilot School before selection by NASA in 1994. He is a veteran of three spaceflights and has logged more than 753 hours in space.

* Col. Yvonne Darlene Cagle has service as a flight surgeon, which helped qualify her for a NASA flight assignment as a mission specialist.

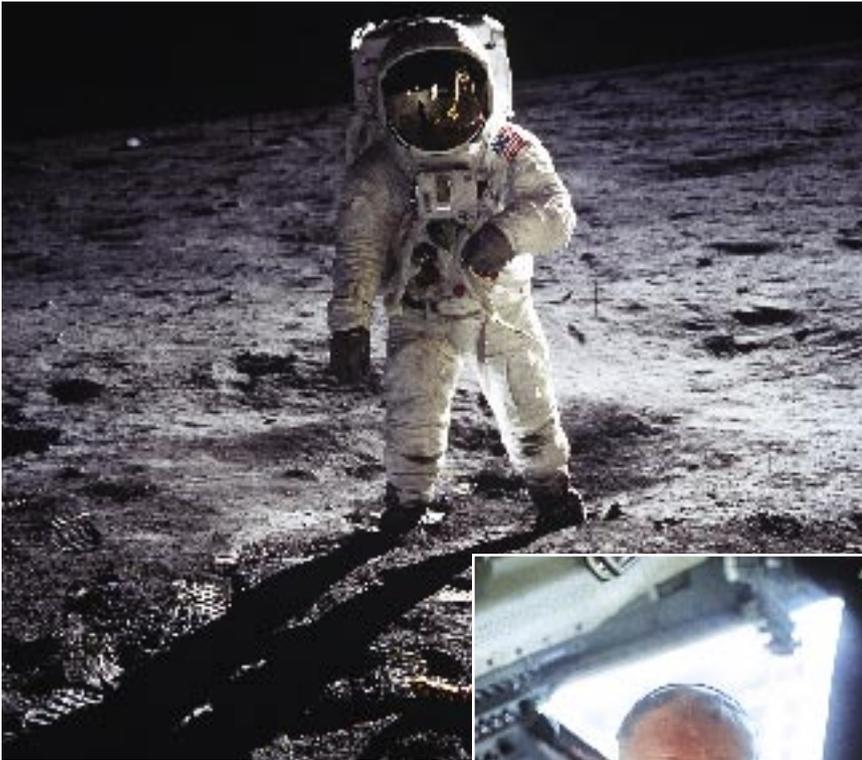
* Retired Col. John H. Casper, a former Wild Weasel pilot, has logged more than 10,000 hours of flying time—and another 825 hours in space.

* Lt. Col. Edward M. "Mike" Fincke is a scientist and graduate of the Air Force Test Pilot School Flight Test Engineer Program. Fincke spent six months aboard the International Space Station, where he made four spacewalks.

* C. Gordon Fullerton, a retired colonel, flew more than 13,000 hours in aircraft and the shuttle prototype *Enterprise*. He has also logged more than 380 hours in space on two space shuttle missions.

* Col. James D. Halsel Jr. has been on five spaceflights. He flew the SR-71 before becoming an astronaut in 1990. Since then he has logged more than 1,250 hours in space.

* Col. Pamela Ann Melroy flew the KC-10 tanker for six years and has combat experience, having flown 200 combat hours during Operation Just Cause and the 1991 Gulf War. She has logged more than 600 hours in space on two space shuttle missions.



Above, Air Force astronaut Col. Buzz Aldrin Jr. walks the surface of the moon on the July 1969 Apollo 11 mission. At right, an interior view of the Apollo 11 lunar module "Eagle" shows Aldrin during the lunar landing mission.

children's future college expenses were considered, the pay levels sometimes rankled the astronauts.

Some Air Force and Marine Corps astronauts have also complained of favoritism shown toward Navy astronauts, in terms of the selection of missions and positions. This favoritism—if in fact it ever took place—seems a thing of the past.

Perhaps most telling, as NASA and the astronaut corps aged, bureaucratic procedures grew, creating another source of discontent.

But, significantly, few astronaut aspirants ever left the program. There were many inconveniences and the challenges were great—but the rewards of actually traveling in space and contributing to America's great space adventure made the delays, uncertainties, and inconveniences worthwhile for most.

Despite the career challenge that space service creates, eight Air Force astronauts have become general officers. Most notable is Gen. Kevin P. Chilton, the head of Air Force Space Command, who reached four-star rank after flying on three space shuttle missions.

The seven others are Lt. Gen. Thomas P. Stafford, Maj. Gen. William A.

Test Office and chief astronaut, NASA Engineering and Safety Center.

Ross received his commission after ROTC at Purdue in 1970. He has flown more than 3,900 hours in 21 different aircraft. But more importantly, as the first human being to be launched into space seven times, he holds the current US records for space walks (nine) and space-walking time (58 hours, 18 minutes). His seven shuttle flights between 1985 and 2002 included one to the Russian Mir and two to the International Space Station.

Col. Guion S. Bluford Jr. was the first African-American astronaut to fly in space. His experience with 144 combat missions in Vietnam was bolstered by serving as a mission specialist on four space shuttle flights.

Col. Eileen M. Collins flew four missions from 1995 to 2005 and was the first female pilot and commander of the space shuttle.

Former USAF Capt. Thomas D. Jones logged four spaceflights and performed three space walks lasting more than 19 hours.

Col. Richard M. "Mike" Mullane flew three space shuttle missions, logging 356 hours in space.

Two tragic accidents have clouded the aura of the space shuttle. The first of these, the *Challenger* disaster of Jan. 28, 1986, claimed the lives of seven people. Among them were shuttle commander Francis R. "Dick" Scobee, who had retired from a distinguished career with the Air Force before joining NASA, and USAF Lt. Col. Ellison S. Onizuka, a mission specialist.

In the second disaster, the space shuttle *Columbia* broke up and was destroyed on re-entry into the atmosphere on Feb. 1, 2003. Seven crew members were again killed, and once again two had Air Force ties. Col. Rick D. Husband, the space shuttle commander, and payload commander Lt. Col. Michael P. Anderson died in that tragedy.

While President Bush has set ambitious goals for NASA and the space program, budget realities threaten the timing and the scope of future manned space exploration in the near term. Whatever happens, however, Air Force astronauts will continue to be in the forefront of American space exploration. ■

Anders, Maj. Gen. Roy D. Bridges Jr., Maj. Gen. Michael Collins, Brig. Gen. Charles M. Duke Jr., Brig. Gen. Susan J. Helms, and Brig. Gen. James A. McDivitt.

From its memorable first manned flight on April 12, 1981 to its current workman-like support of the International Space Station, the space shuttle has been both a triumphant scientific achievement and the center of a growing controversy over its cost, schedule, and implicit hazard.

Space shuttle and International Space Station veterans include many airmen. Among the most notable is retired Air Force Col. Jerry L. Ross, who is now chief of the Vehicle Integration

Walter J. Boyne is a contributing editor of Air Force Magazine. He is a former director of the National Air and Space Museum in Washington, a retired Air Force colonel, and an author. He has written more than 600 articles about aviation topics and 40 books, the most recent of which is Roaring Thunder. His most recent article for Air Force Magazine, "The Famous Flying Lockheed Brothers," appeared in the August issue.