



## Apollo 11: “One Giant Leap”

On July 20, 1969, Apollo 11 answered the May 25, 1961, challenge issued by U.S. President John F. Kennedy to “land a man on the Moon.” Building on the efforts of more than 400,000 people from essentially every state in the Union, as well as the foundations of engineering and technological contributions of countless others before them, Neil Armstrong, Edwin (Buzz Aldrin) and Michael Collins took a “giant leap for mankind.”

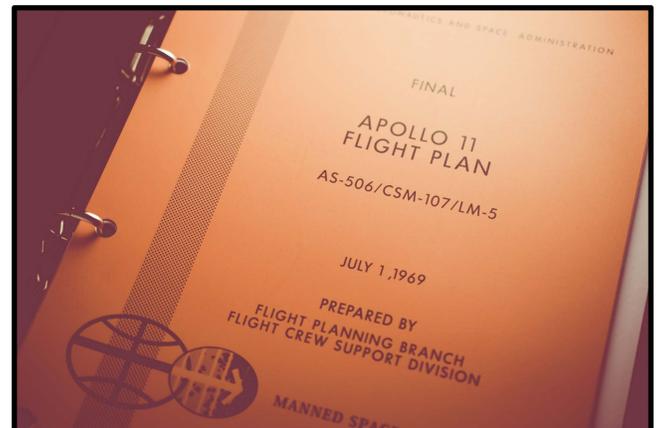
For a fleeting moment in a tumultuous time in history, people of the world were united in witnessing perhaps the greatest technological achievement of the 20<sup>th</sup> century.

*All photos courtesy of NASA.*



## Major Mission Objectives:

- Execute the first human landing on the Moon.
- Walk on and observe the lunar surface.
- Deploy various measuring instruments and conduct scientific experiments.
- Collect samples of lunar soil and rocks for scientific examination back on Earth.
- Study the Moon’s surface from above.
- Return safely to Earth.



## The Crew

The Apollo 11 astronaut crew was composed of three Gemini program veterans. Commander Neil Armstrong from Wapakoneta, Ohio, had been Command Pilot of the Gemini 8 mission. Edwin E. (Buzz) Aldrin served as Lunar Module Pilot, having executed a highly successful spacewalk on Gemini 12. Michael Collins rounded out the crew as its Command Module Pilot, a spot earned following his service with John Young aboard Gemini 10.

Apollo 11 would be the final flight for all of these astronauts, as they went on to various government and private sector roles following their mission.



*From left to right: Armstrong, Collins and Aldrin.*

## Launch and Flight

On July 16, 1969, at 9:32 Eastern Daylight Time on a sunny Florida morning, Apollo 11 launched from Launch Complex 39A at Cape Kennedy (later renamed Cape Canaveral), Florida. The first stage of the mammoth Saturn V booster, burning 15 tons of propellant per second for the first two-and-a-half minutes of the flight, launched Apollo 11 to an altitude of 42 miles and 70 miles east of Cape Canaveral, traveling 6,300 miles per hour.

Second and third stage boosters finished the job of putting Apollo 11 into Earth orbit for a brief check of systems before reigniting the third stage for a three-and-a-half-day coast to the Moon.

After entering lunar orbit, the Lunar Module (LM) “Eagle” separated from the Command Module “Columbia” for its fateful descent to the surface.



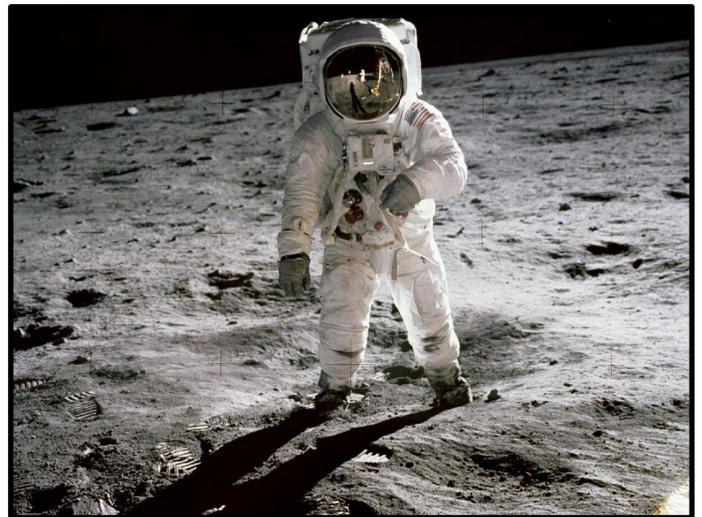
Communication and data reception issues plagued the early part of Eagle's descent to the Moon, and several rare "Program Alarms" presented a risk of mission abort. However, previous simulations and quick thinking by Mission Control staff allowed Armstrong and Aldrin to proceed.

Then, at 3:17 pm EDT, with mere seconds of fuel remaining, extensions on the LM's footpads signaled a "contact light" inside and Neil Armstrong guided it the last few feet to the Moon's surface, where he proclaimed, "Houston: Tranquility Base here. The Eagle has landed".

About six hours later, with a global television audience estimated at 600 million, Neil Armstrong descended the ladder of the Lunar Module, tested the surface briefly and then stepped off, uttering the immortal words, "That's one small step for [a] man. One giant leap for mankind."

Aldrin followed Armstrong soon after, and they spent about two and a half hours taking photos, raising a U.S. flag, reading a commemorative plaque attached to the leg of the LM, speaking to then-president Richard Nixon, setting up experiments and collecting about 48 pounds of soil and rock samples. This was followed by a smooth ascent from the Moon and a three-day trip home, concluding with a splashdown in the Pacific Ocean on July 24.

To ensure the crew did not bring organisms back from this strange new world, the astronauts spent 21 days in quarantine. No such organisms were detected. Soon after their release, the crew soon embarked on a multi-country goodwill tour.



## Mission Insights

The Apollo 11 Moon landing is regarded by many to be the most significant engineering feat of the 20<sup>th</sup> century. It captivated the imagination of people around the world, despite U.S. polls indicating that many might have preferred directing the financial resources to other pressing societal needs.

Aside from being the first visit by humans to another celestial body, the Apollo mission also led to scientific discoveries about the Moon and, ultimately, the Earth.

The Apollo program also is credited with many important commercial spinoffs that still affect our lives, including computer and semiconductor technologies, advancement in materials science, radio and television communications, microwave ovens, food storage, insulation and more.

The success of Apollo 11 paved the way for the remaining Apollo missions and other programs using the Saturn IB and Saturn V boosters and the Command and Service Modules. These include the first U.S. space station, Skylab, and the first joint U.S.-USSR space mission, Apollo-Soyuz.

From a cultural perspective, Apollo 11 put one common tome to rest, “We can no more do [that] than we can fly to the Moon,” and, gave birth to a new one, “If we can put a man on the Moon, we can ...”.

While the memory of the 1960s may fade, NASA, the Smithsonian Air and Space Museum and other countless museums around the world have preserved iconic elements of early U.S. space programs, including their crown jewel, Apollo 11.

