



## Apollo 14: Veteran Shepard and Crew Return America to the Moon

Following the explosion aboard the Apollo 13 Service Module and the harrowing return of its crew to Earth, NASA took several months to investigate and make necessary changes. This delayed the launch of Apollo 14. Also delaying the mission was a decision to move Apollo 14's target to the original Apollo 13 landing site, Fra Mauro. This changed the mission plan and training regimen for the Apollo 14 crew.

Although Apollo 14 visited the intended Apollo 13 landing site, it did differ from the Apollo 13 mission in its scientific instrument package and objectives.

Although in some respects Apollo 14 is best known for its iconic Commander and the first golf shot on the Moon, this mission is perhaps most important for saving the Apollo program, returning NASA to Luna after Apollo 13's failure to reach its objective.



*All photos by NASA unless otherwise noted.*

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### Major Mission Objectives:

- Land in the Fra Mauro Highlands.
- Conduct two four-hour Moon walks.
- Deploy passive and active seismic (meteoroid and “moonquake”) experiments.
- Deploy solar wind ion detection equipment.
- Photograph candidate future landing sites.





*From left to right: Roosa, Shepard, and Mitchell*

## The Crew

Apollo 14 crew was led by America's first astronaut in space, Alan Shepard, veteran of the Mercury program Freedom 7 suborbital mission in 1961. Shepard had been grounded since 1963 due to Ménière's disease, a disorder of the inner ear. However, the condition was addressed with a new surgical procedure in 1969 and Shepard was reinstated for Apollo. Commander Shepard was joined by Command Module Pilot Stuart Roosa and Lunar Module Pilot Edgar Mitchell. Apollo 14 was the final mission for all three crew members.

## Launch and Flight

On January 31, 1971, Apollo 14 launched from Launch Complex 39A at Cape Kennedy (later renamed Cape Canaveral), Florida, following a 40-minute weather-related launch delay, the first for an Apollo mission. The first, second, and third stages of the Saturn V rocket performed normally launching the spacecraft toward the Moon. However, the crew had difficulty in docking their Command and Service Module (call sign "Kitty Hawk") with the Lunar Module ("Antares"). Only after two hours of trying were they ultimately successful.

The mission then proceeded normally through the coast phase to the Moon, Lunar orbit insertion, and separation of the Lunar Module for descent to the Moon.

The first problem on descent was the appearance of a faulty "abort" signal which required a reprogramming of computers to ignore the warning.



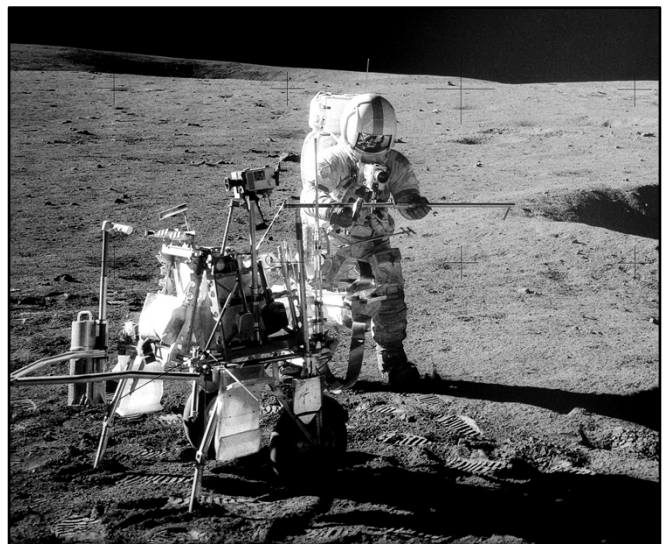
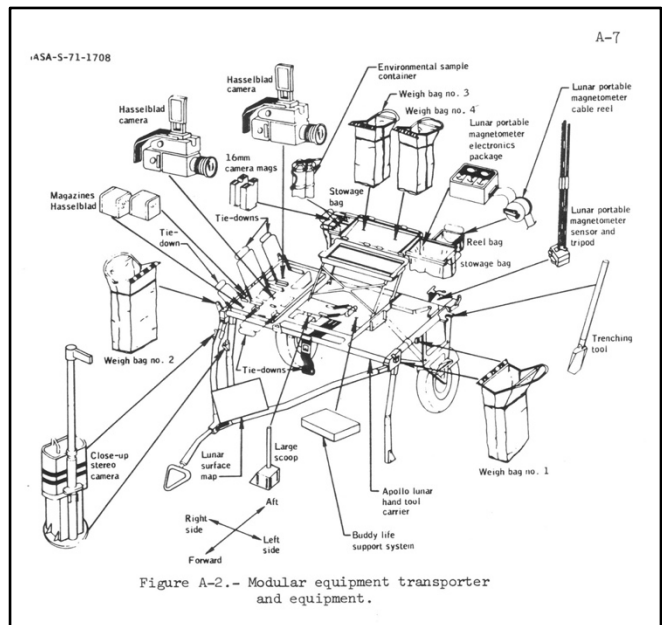
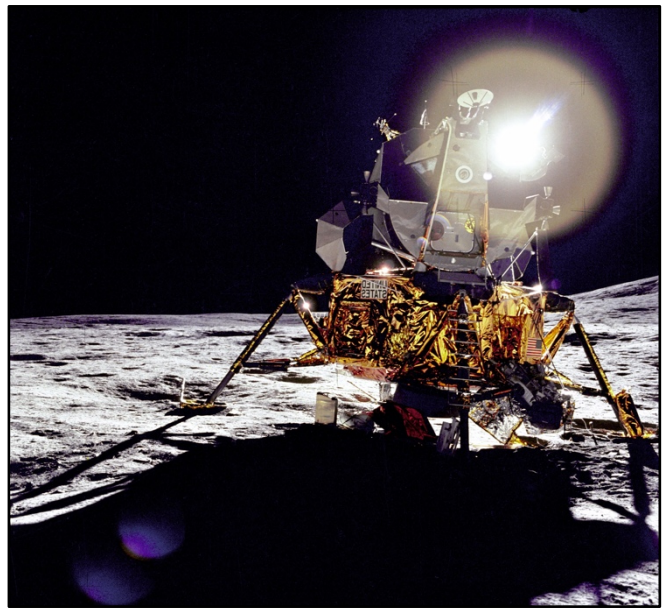
Then, the Lunar Module's landing radar failed to lock onto the surface, which might have prevented landing. This was corrected by cycling the radar breaker.

Despite the glitches, Shepard and Mitchell landed safely on the Moon on February 5, setting down closer to its planned landing spot than any other Apollo mission.

As the last of the Apollo "G" missions, their plan called for two Extravehicular Activities (EVAs, or "Moon walks") over two days. The first EVA was delayed for about five hours due to a communications issue. Once that was fixed, the crew was able to descend to the Moon's surface and Shepard and Mitchell were successful in implementing plans to set up equipment, collect samples, take photos, and load equipment onto their "Modular Equipment Transporter" or MET.

The MET was a two-wheeled equipment cart with two support legs, which could hold a variety of tools, instruments, and cameras. The Apollo 12 crew had noted that carrying their equipment around was tiring and time-consuming, so the MET, which the Apollo 14 crew called a "rickshaw", was designed to make their work faster and easier. However, in practice the astronauts often had difficulty rolling it on the soft, uneven, and sloped surface. At one point they had to pick it up and carry it. On future missions it was replaced by the motorized Lunar Rover.

On their second traverse Shepard and Mitchell planned to take samples at Cone Crater, which planners hoped would yield some of the oldest rocks to be collected on the Moon.



However, the crew labored in reaching the crater rim, and found it difficult to gauge distances. So, they were eventually directed to take samples and return to the vicinity of the Lunar Module. Post-mission map analysis and images taken years later by the Lunar Reconnaissance Orbiter spacecraft suggest that they were only about 65 feet from their objective.

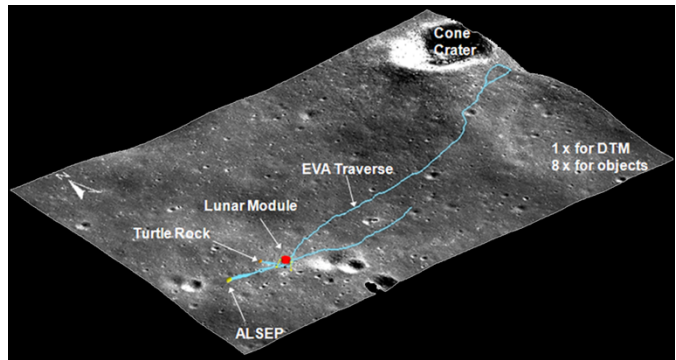
Upon returning to the Lunar Module site, Alan Shepard, an avid golfer, performed a stunt that he had long planned. Attaching a 6-iron head to a rock sampling handle, he struck two golf balls, suggesting after the more successful second swing that the ball flew for “miles and miles”. Estimates range about 100 yards to perhaps over a mile. Shepard and Mitchell themselves reported that the second ball may have traveled a few hundred yards.

*Golf club photo by National Air & Space Museum*

Perhaps due to the change in the mission plan, and perhaps due to the crew’s reported relative disinterest in their geology training, there has been some criticism of the lack of documentation of Apollo 14’s lunar samples, the relative lack of variety among the samples, and the relatively small proportion of samples collected near Cone Crater.

That said, the largest sample returned was a 19-pound rock dubbed “Big Bertha”, which turned out to contain a 2 cm chip of what is very likely the oldest Earth rock ever found - a terrestrial meteorite from Earth that struck the Moon!

The experiments conducted by Stu Roosa in lunar orbit aboard the Command Module were deemed a complete success.



After lift-off from the Moon the Ascent Module of Antares docked with Kitty Hawk and the crew returned to Earth, splashing down in the South Pacific Ocean on February 9. The crew, which had been quarantined prior to the mission because of the measles scare of Apollo 13 also quarantined for 18 days after their return. They were the last Apollo crew required to quarantine before or after their flight.

## Mission Insights

During the return from lunar orbit to Earth orbit, Lunar Module Pilot Edgar Mitchell, who had an interest in paranormal phenomena, conducted non-sanctioned extra-sensory perception (ESP) experiments during his rest periods, in which he “communicated” symbols on cards to four individuals on Earth. He stated after the mission that two of the four had gotten slightly more than a random number of symbols correct.

Stu Roosa, who had been a wildland firefighter or “smoke jumper” early in his career, brought 500 tree seeds on the mission, many of which were donated to the US Forest Service. Seedlings grown from these seeds were distributed to several states. In 1988, Iowa acquired a second-generation “Moon Tree” grown from a seed from one of the original Apollo 14 American Sycamores. It can be found in the Heritage Tree Museum, Sunset Park, Storm Lake, Iowa.

*Moon Tree photos by Dan Hoy*

The Apollo 14 Command Module (CM) “Kitty Hawk” is on display at the Kennedy Space Center in Florida.

*Apollo 14 CM photo by The Kennedy Space Center*

