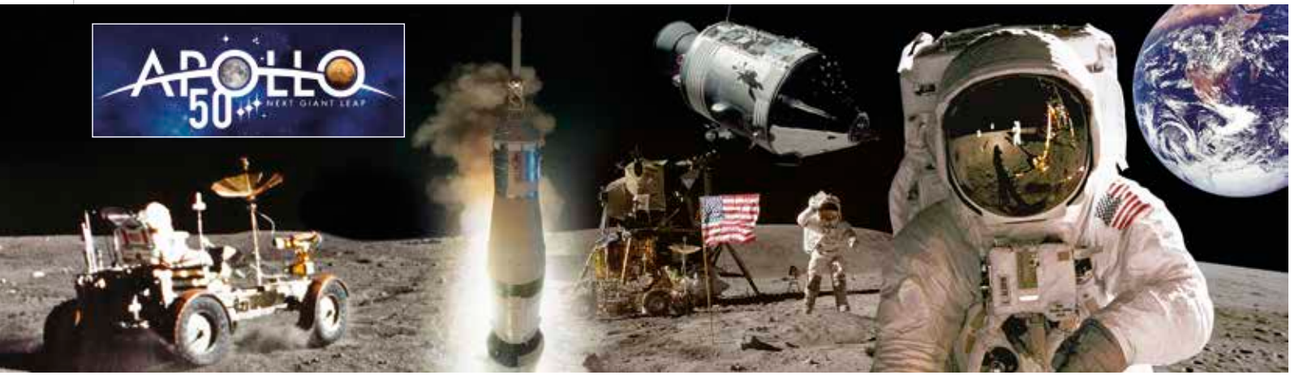


50 YEARS OF APOLLO

APOLLO 7

50 years ago, NASA launched its first crewed test of the Apollo programme. While the mission went smoothly for the module, the same could not be said for the crew. Elizabeth Pearson looks back at the mission

MISSION BRIEF

Launch date: 11 October 1968
Launch location: Launch Complex 34, Cape Kennedy, Florida
Orbits: 163
Furthest distance travelled from Earth: 301km
Duration: 10 days, 20 hours, 9 minutes
Return date: 22 October 1968
Main goals: Test docking procedure; test engine system; assess effects of long duration spaceflight
Firsts: Crewed Apollo mission; live television broadcast from space
Typical menu: Pot roast, Canadian bacon and apple sauce, sugar cookies and butterscotch pudding

NASA X 16

This October marks the 50th anniversary of Apollo 7, the programme's first crewed spaceflight. Over the 11-day mission, the crew tested the Apollo hardware while in the relative safety of low-Earth orbit, practiced the manoeuvres that would be needed to land on the Moon and made the first ever live TV broadcast from space – all of them small steps on the giant leap towards the Moon.

From the outset of the mission, tensions were high. NASA had delayed crewed Apollo missions after a fire on 27 January 1967 had killed all three Apollo 1 astronauts. The Apollo team had spent the last 20 months performing safety evaluations and checks, until they were certain that not only could they land a man on the Moon, but also return him safely to the Earth.

Satisfied with their checks, NASA gave Apollo 7 the all clear, and on 11 October 1968 astronauts Walter M Schirra Jr, Donn F Eisele and R Walter Cunningham launched into orbit from Cape Kennedy.

> "Where there is a will there is a way, and I will find a way to eat this fruit cocktail" – Walter Cunningham

▲ Apollo 7 launched on a Saturn IB SA-205 rocket from Cape Kennedy

◄ A technician called Apollo 7's partially opened fairings a "four-jawed, angry alligator", referencing Tom Stafford's comment during the Gemini IX mission that the Augmented Target Docking Adapter looked like an "angry alligator"

▼ Pre-cold, pre-mutinous crewmembers

The main goal of the mission was to test the Apollo hardware in action. The first big test came only a few hours after launch, when the crew simulated docking with a lunar landing module. In subsequent Apollo missions, the Lunar Module would be stored behind the part of the spacecraft where the astronauts lived and worked, called the Command Service Module (CSM). Before the astronauts could land on the Moon, they would first have to detach from the CSM, turn around, dock with the lander and pull it out of its housing.

Apollo 7 needed to practise this, but as they didn't have a Lunar Module they instead simulated the manoeuvre using a test rig. Things didn't start off well, though, as the panels covering the rig didn't fully open. However, thanks to Lunar Module pilot Walter Cunningham's expert flying skills, they managed to make the docking.

Firing up the CSM's engines

The crew also tested the engines that would propel the CSM towards the Moon, put it into orbit and then allow it to return to Earth. Without these engines, reaching the Moon was impossible. When the crew first test fired the engine, the kick was so powerful Schirra yelled out, "Like a bomb, yabadabadoo! Great man! That's like a ride and a half down there gang." They tested the engines a total of eight times with no major problems.

Afterwards the crew continued to drift from the second stage of their Saturn IB until they were 120km away. At this point they turned around and rehearsed rendezvousing with the stage. A similar manoeuvre would be vital for the future Command Module pilots left in orbit around the Moon, who would have to pick up the lunar ascent stage when the moonwalkers returned from the surface.

With that test successfully completed, the big engineering tasks were all out the way, and the team settled in for the remaining nine days of the mission. Apollo 7 was the longest spaceflight undertaken up to that point, and the endeavour would help to flag up not only hardware issues, but problems with how the missions were run.

Things started well. The crew could easily move around the cabin, which was far larger than either the previous Mercury or Gemini spacecraft, and fears that their motion would destabilise the module proved unfounded.

The crew did encounter a few minor problems. The astronauts had brought too much sweet food. Though rich in calories, they quickly went off the taste, and advised future Apollo astronauts to ▸

THE ASTRONAUTS

Commander: Walter M Schirra Jr
By the time of his Apollo 7 flight Schirra was already a space veteran. He was one of the original Mercury Seven astronauts and had flown in both the Mercury and Gemini programmes. After Apollo 7 he retired from NASA, and became a news consultant for the subsequent Apollo missions. He died in 2007, aged 84.

Command Module pilot: Donn F Eisele
Before joining NASA, Eisele was a test pilot with the US air force with over 4,200 hours of flying time under his belt. He was originally selected to pilot Apollo 1, but dislocated his shoulder during training and was reassigned to Apollo 7. He left NASA in 1972 to become country director of the Peace Corp in Thailand and died in 1987, aged 57.

Lunar Module pilot: R Walter Cunningham
Cunningham was a fighter pilot with the US Marine Corps and has a degree in physics. Though there was no lunar module on Apollo 7, he conducted the tests that would allow future missions to operate a lander. After leaving NASA he became a businessman, investor and writer. He currently works as a radio talk show host.

◂ Tuamotu Archipelago in the South Pacific, taken by the Apollo 7 spacecraft during its 141st orbit

▸ choose ham and soup over butterscotch pudding. Additionally, the fuel cells overheated, though not dangerously so, and the fans in the living space were so noisy the crew had to turn them off. These were all minor issues and quickly fixed. But there would be some trickier challenges involving one of the most vulnerable and unpredictable components of the mission – the crew itself.

On the first day in orbit, mission commander Schirra developed a cold. Within the sealed environment of the Apollo craft, it wasn't long before the other two astronauts caught it too. Without gravity to help clear out their sinuses, the crew soon found themselves uncomfortably stuffed up. Sick, and with a demanding schedule that prevented them getting enough sleep, the crew became irritable and bickered constantly with ground control.

The first signs of trouble centred around what was supposed to be the first ever live television broadcast from space. Before flying, mission commander Schirra had requested the broadcasts be removed from what was an already crowded schedule, but NASA felt obliged to show the US public where their tax dollars were going. When the time for the first broadcast came around, Schirra refused to turn the cameras on, stating, "We do not have the equipment out… we have not eaten at this point. At this point, I have a cold. I refuse to foul up our time lines in this way."

When the broadcast did eventually go ahead two days later on 14 October, the astronauts smiled throughout, showing no sign of the strife going on behind the scenes.

Pressure points

The biggest argument came towards the end of the mission. The crew members were concerned that their colds could stop their ears adapting to the changes in pressure during re-entry, and wanted to be able to blow their noses to prevent their eardrums bursting. While previous spacesuits had come with a visor, the Apollo suits had full domes that needed to be completely removed every time someone wanted to blow their nose. As they would be fully suited up during re-entry, including cumbersome gloves, this was an extremely awkward procedure, so the astronauts decided to forgo their helmets.

> "We all three have our colds. I asked for an hour and a half sleep for each of us last night, and that apparently was ignored" – Walter Schirra

Fearing that anything less than a perfect landing could cause an injury, ground control ordered them to wear their helmets. The crew ignored them. Acknowledging that there was nothing they could do to force the astronauts to comply, a flight controller told the crew, "It's your neck and I hope you don't break it."

In the end re-entry and splashdown went smoothly, with neither burst eardrums nor broken necks. The 'mutiny' made NASA understand the importance of giving future astronauts a decent menu and enough time to rest, but the insubordination of the Apollo 7 crew ensured that none of them would ever fly in space again.

Despite these setbacks, the mission was a success. The Apollo hardware worked. The stage was set and the Apollo programme was finally ready to leave the safety of Earth and head for the Moon.

▴ Schirra (left) and Cunnigham (right) were both suffering from colds by the end of the mission, making them grouchy

NASA X 8, ILLUSTRATION BY PAUL WOOTTON

MISSION TIMELINE

11 Oct, 15:02 GMT
Apollo 7 lifts off on top of a Saturn IB, a smaller version of the rocket that would take future crews to the Moon.

11 Oct, 15:05 GMT
First stage runs out of fuel and drops away. Liquid hydrogen-fuelled second stage (S-IVB) takes over.

11 Oct, 15:13 GMT
Apollo 7 reaches an orbital path of 227-285km.

11 Oct, 17:57 GMT
The Command Service Module separates from S-IVB, turns around and simulates docking with a Lunar Module.

12 Oct, 17:27 GMT
The engines that would take future Apollo missions to the Moon are given a test fire.

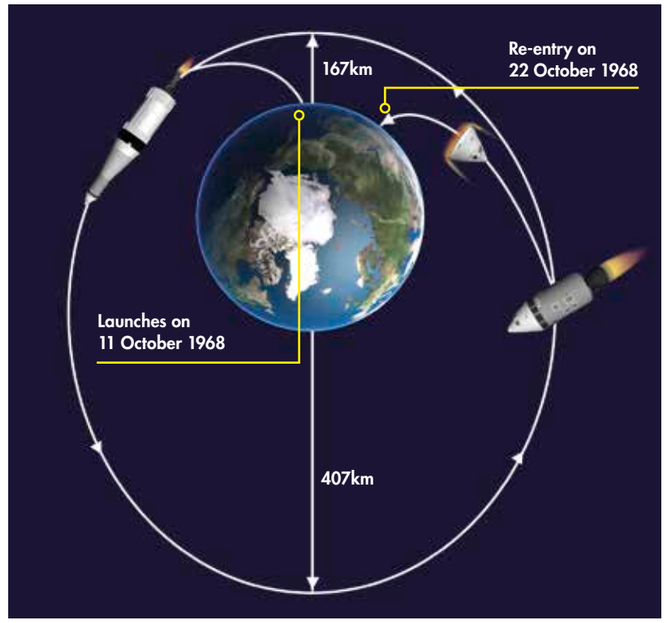
12 Oct
Apollo 7 drifts 120km away from the S-IVB, then returns in a rehearsal for finding a lander returning from the lunar surface.

14 Oct, 14:45 GMT
The first live TV broadcast from space begins after a two-day delay caused by crew tensions.

22 Oct, 10:56 GMT
The crew re-enters Earth's atmosphere.

22 Oct, 11:11 GMT
Apollo 7 splashes down in the Atlantic Ocean.

▸ NASA's original flight plan for the Apollo 7 mission. In reality the orbit varied between 227km and 163km



▾ The crew gamely smiled for the first live TV broadcast from space despite their issues with ground control

> "The only thing we're concerned about is the landing. We couldn't care less about the re-entry. But it's your neck and I hope you don't break it" – Capcom

The crew aboard USS Essex on 22 October 1968 just after being hoisted from the sea

▾ Schirra exiting the Command Module after splashdown in the Atlantic

ABOUT THE WRITER
Dr Elizabeth Pearson is *BBC Sky at Night Magazine*'s news editor. She gained her PhD in extragalactic astronomy at Cardiff University