ROUNDUP

Lyndon B. Johnson Space Center

NASA

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July 20, 1979: Tenth anniversary of man's first steps on the Moon

Apollo 11, from launch to splashdown

It is 9:32 a.m. EDT July 16, 1969. On schedule to within less than a second, Apollo 11 blasts off from Cape Kennedy, Florida, to start what is looked upon as the greatest single step in human history—a trip to the Moon, a manned landing, and return to Earth.

Watching is a worldwide television audience and an estimated million eyewitnesses. Standing three and one-half miles away on the sandflats or seated in grandstands are half the members of the U.S. Congress and more than 3,000 news representatives from 56 countries.

Launch comes after a 28-hour countdown. The flame appears as a bright yellow-orange star on the horizon. As the spacecraft reaches the top of the service tower, the thunder of the firing engines rolls over the Florida landscape and engulfs the viewers like a tidal wave.

They witness the beginning of the fifth manned Apollo flight, the third to the vicinity of the Moon, and the first lunar landing mission.

Onboard are Neil A. Armstrong, Commander; Michael Collins, Command Module Pilot; and Edwin E. "Buzz" Aldrin, Jr., Lunar Module Pilot.

"Eleven, this is Houston. Your guidance is converged, you are looking good."

"Downrange 140 miles, altitude is 62 miles, velocity 10,000 feet per second."
"Eleven, Houston. You are GO at four minutes."

Three hours after launch the three Saturn stages fire one after another and the first two are jettisoned. Apollo 11 enters a 103 nautical mile-high Earth orbit during which the astronauts and ground control crew carefully check out the vehicle.

Another firing another three hours later boosts Apollo 11 out of Earth orbit and onto its lunar trajectory an initial speed of 24,200 miles an hour.

The flight on schedule, crewmembers keep busy with housekeeping duties such as checking oxygen reserves and charging batteries. They have to make occasional mid-course corrections and keep in constant contact with Mission Control Center.

"There's plenty of room for the three of us. After awhile you get sort of tired of rattling around and banging off the ceiling and the floor and the side. You tend to find a little corner somewhere and wedge yourself in. That seems more at home. And Neil's standing on his head again. He's trying to make me nervous."

July 19, at 12:58 p.m., ground control informs the crew, "We're 23 minutes away from LOI (Lunar Orbit Insertion) burn."

The spacecraft passes completely behind the Moon and out of radio contact with Earth for the first time. The main rocket, a 20,500 pound thrust engine, fires for about six minutes to slow the vehicle so it can be captured by lunar gravity.

The entire orbital insertion takes place while the craft is still behind the Moon, out of radio contact.

July 20 at 9:27 a.m., Aldrin crawls into the lunar module, the Eagle, and starts to power-up the spacecraft. About an hour later, Armstrong enters the LM, and together they continue to check the systems. They deploy the landing legs.

At 1:46 p.m. the landing craft separates from the command module, the Columbia. Collins fires the command ship's rockets and moves about two miles away to continue to orbit the Moon.

"The auto targeting was taking us right into a football field sized crater, with a large number of big boulders and rocks for about one or two crater diameters around us. It required flying manually over the rock field to find a reasonably good area."

4:05 p.m.: The landing will not be easy. The site Armstrong and Aldrin approach is four miles from the target point. Armstrong takes over manual control and steers the craft to a smoother spot.

His heartbeat has risen from a normal 77 to 156.

4:18 p.m.: The craft settles down with a jolt almost like a jet landing on a runway. Armstrong immediately radios Mission Control: "The Eagle has landed."

First task after landing is to prepare the ship for launch, to see that all is ready to make the ascent back to rendezvous with the command module orbiting above.

At 10:39 p.m., with everything in order, Armstrong opens the LM hatch and squeezes through the opening. Strapped to his shoulders is a portable life support and communications system weighing 84 pounds on Earth, 14 on the Moon. He moves slowly down the 10-foot nine-step ladder, deploying a television camera on the second step so that people on Earth can watch.

10:56 p.m.: Armstrong puts his left foot on the Moon. "That's one small step for a man, one giant leap for mankind," Armstrong radios. Aldrin is taking photographs from inside the craft.

"There seems to be no difficulty in moving around as we suspected. Got to be careful that you are leaning in the direction you want to go. In other words, you have to cross your foot over to stay underneath your center of mass."

"There seems to be no difficulty in moving around as we suspected," Armstrong says. He collects a small bagfull of soil and stores it in a pocket of the left leg of his space suit. This is done early, according to plan, to make sure some of the Moon surface is returned to Earth in case the mission has to abort.

At 11:11 p.m., Aldrin backs down the ladder and joins Armstrong. As scheduled, the astronauts set up the first of three experiments, a foot-long tube containing a roll of aluminum foil. Its function will be to collect particles of "solar wind" blowing constantly through space so they can be brought back to Earth and analyzed.

From a leg of the spacecraft, the astronauts take a three-by-five-foot nylon United States flag and erect it on a staff pressed into the lunar surface.

Armstrong next sets up a folding table and opens two specimen boxes. Using tongs and the lunar scoop, he picks up a quantity of rocks and soil, seals them in boxes, and places them in the ascent stage of the landing craft.

Collins is still circling the Moon every 47 minutes in the Command Service Module.

"It's a happy home up here in the command module. It'd be nice to have company. As a matter of fact, it'd be nice to have a couple of hundred million Americans up here."

Aldrin removes two devices to be left on the Moon. One is a seismic detector, to record moonquakes, meteorite impact, or volcanic eruption. The other is a laser-reflector, a device designed to make measurement of Earth-Moon distances more precisely than have ever been made before.

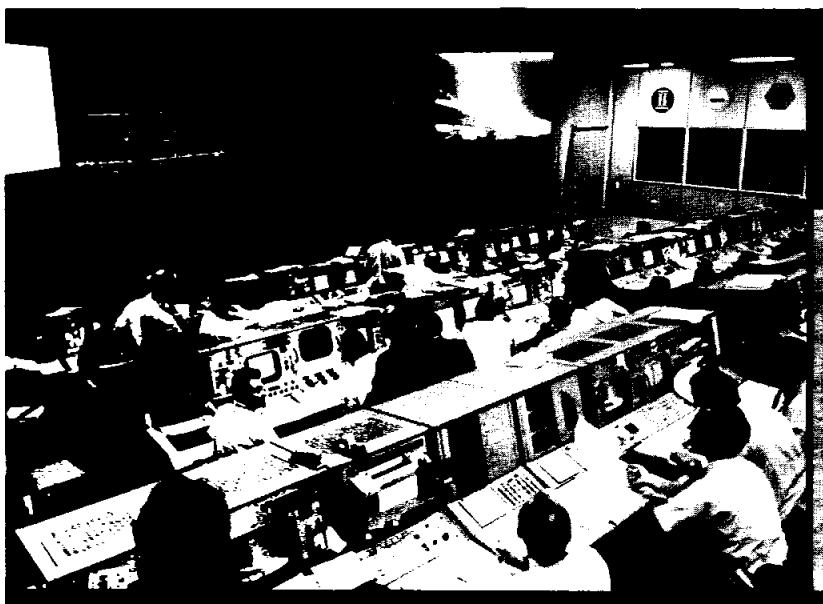
All chores completed, the two return to the lunar module. At 1:11 a.m. July 21, the hatch is closed. The astronauts remove the portable life support systems on which they have depended for two hours and 47 minutes.

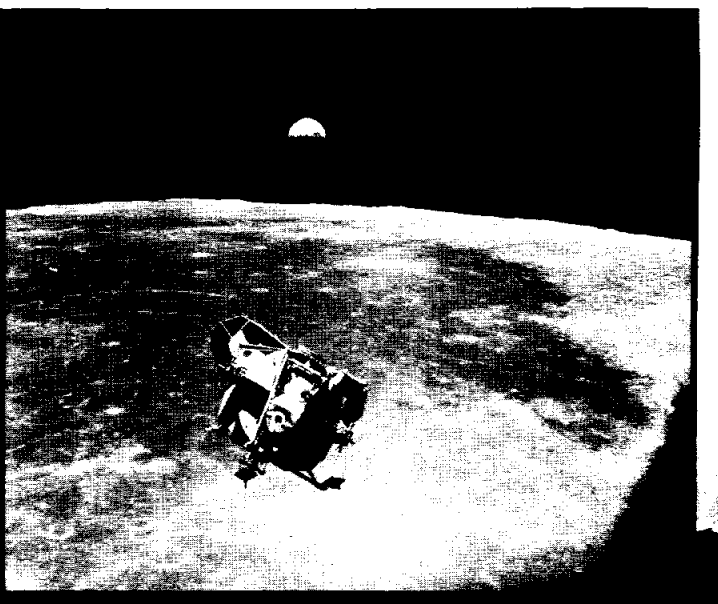
"Houston, Tranquility Base. Repress complete."
"Roger, Tranquility. We observed your equipment jettison on TV and the passive seismic experiment reported shocks when each PLSS hit the surface. Over."
"You can't get away with anything anymore can you."

That afternoon, the ascent engine is started and the LM redocks with Columbia at 5:35 p.m. The astronauts prepare for the trip home to Earth.

They splash down southwest of Honolulu, 13 nautical miles from the recovery ship, the U.S.S. Hornet.

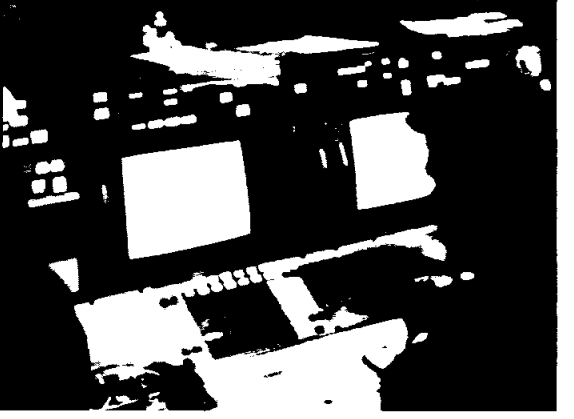
So ends man's first mission to the Moon. It has lasted 195 hours, 18 minutes, and 35 seconds—a little more than eight days. It accomplished the goal set by President John F. Kennedy, for man to reach the Moon and return to Earth within the decade of the 1960's.

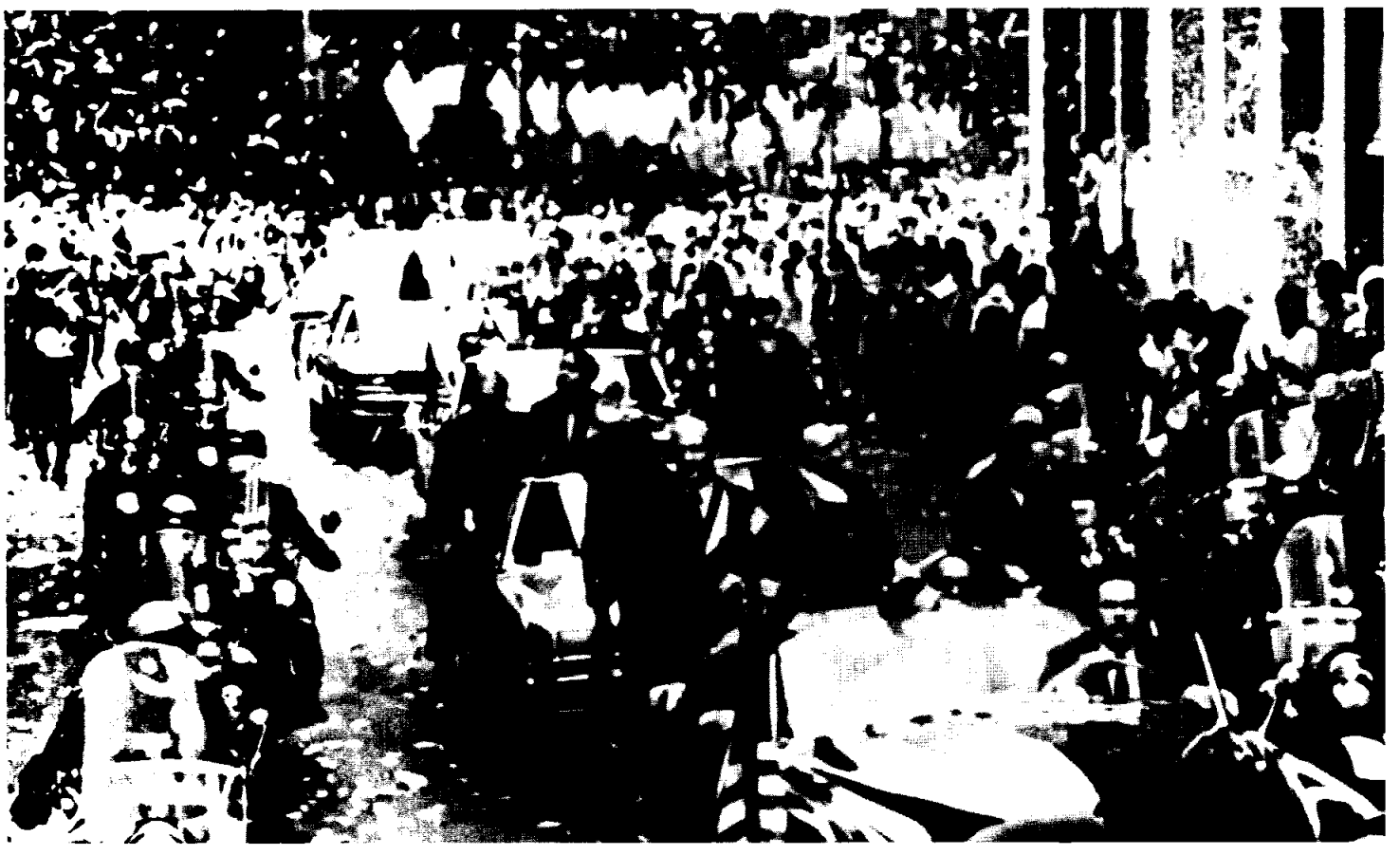




APOLLO 11

We reach the Moon





Heroes' welcome & back to work

When the Apollo 11 astronauts returned, crowds in cities across the world greeted them with parades and glory. They were a focal point of pride for an acomplishment that involved the work of a half a million persons—from space suit technicians to welders of exotic metals to computer science wizards.

Today Neil Armstrong is a professor of Aerospace Engineering and Applied Mechanics at the University of Cincinnati. Michael Collins is Undersecretary of the Smithsonian Institution in Washington, D.C. And Edwin Aldrin is a writer living in Los Angeles.

A total of 12 men walked on the Moon during Apollo's 17 missions. They took the first steps for NASA's 61 astronauts currently in training for Space Shuttle missions to follow.

NASA looks to the next 10 years

Hovering over a control panel, an astronaut maneuvers levers with concentrated precision. He speaks into his headset mike, "The payload is directly over the cargo bay."

"Roger. Deploy the payload," says the voice from Mission Control, 500 km below. The satellite is deployed into orbit.

A mission specialist climbs up from the crew quarters, pushes off from the wall, and floats to the airlock chamber where she dons an EVA (Extra Vehicular Activity) suit and goes outside the space ship to adjust dials on a cosmic ray enumerator experiment, part of this mission.

On Earth, an orbiter has just launched from Cape Kennedy—the 40th Shuttle mission this year, with 20 more planned before December.

"Men and women will spend longer and longer periods of time in space in the next decade," says NASA Administrator Robert Frosch. "It will be because there will be more and more work for them to do there."

When the Space Transportation System (the Space Shuttle) is operational in 10 years, trips into Earth orbit will be standard, commonplace. Space tugs, upper stages, and orbital transfer vehicles will enable Shuttle crews to place satellites in higher and sometimes geosynchronous orbits.

Retrieval of space hardware will be a regular part of Space Shuttle missions.

Highly skilled construction workers will build modules of increasing capacity to collect solar power. These modules will provide solar energy for increasingly large structures in space.

NASA hopes in 10 years to have a permanently manned space station under development. Here, scientists working in weightlessness will be able to combine or separate chemical elements in a way not possible in gravity. Medical science, pharmaceuticals, and metallurgy are only a sample of the fields that will advance with the space program.

The Space Telescope, scheduled to be orbited by the Shuttle in 1983, will be the key and centerpiece of astronomy for the next decade—with a resolution 10 times greater than any telescope on Earth.

The Shuttle will launch follow-on unmanned explorations of Venus, Mars, and Saturn, and our first reconnaissance flights to comets and asteroids. Crews will make regular trips into orbit for service, repair, and modifications of satellites.

And through it all, people will adapt and learn to live in a new environment—space.

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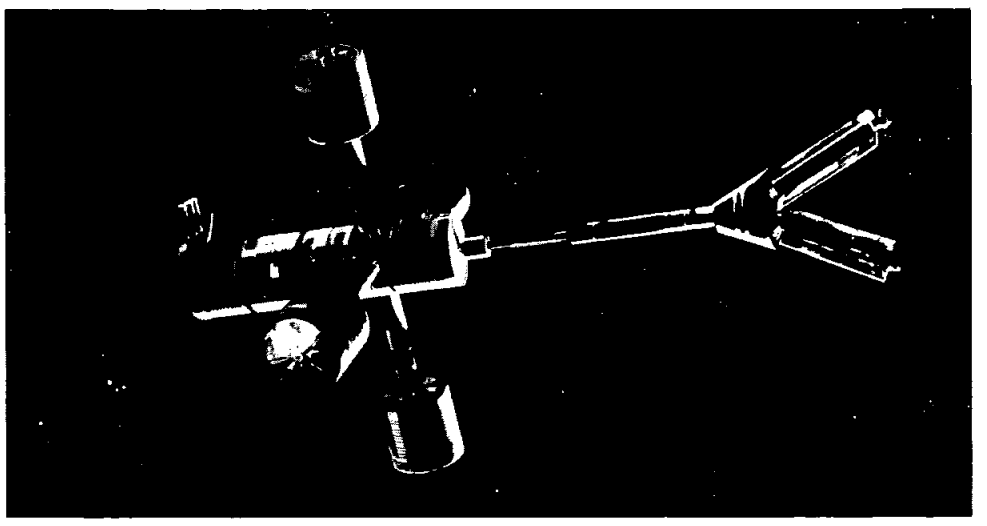
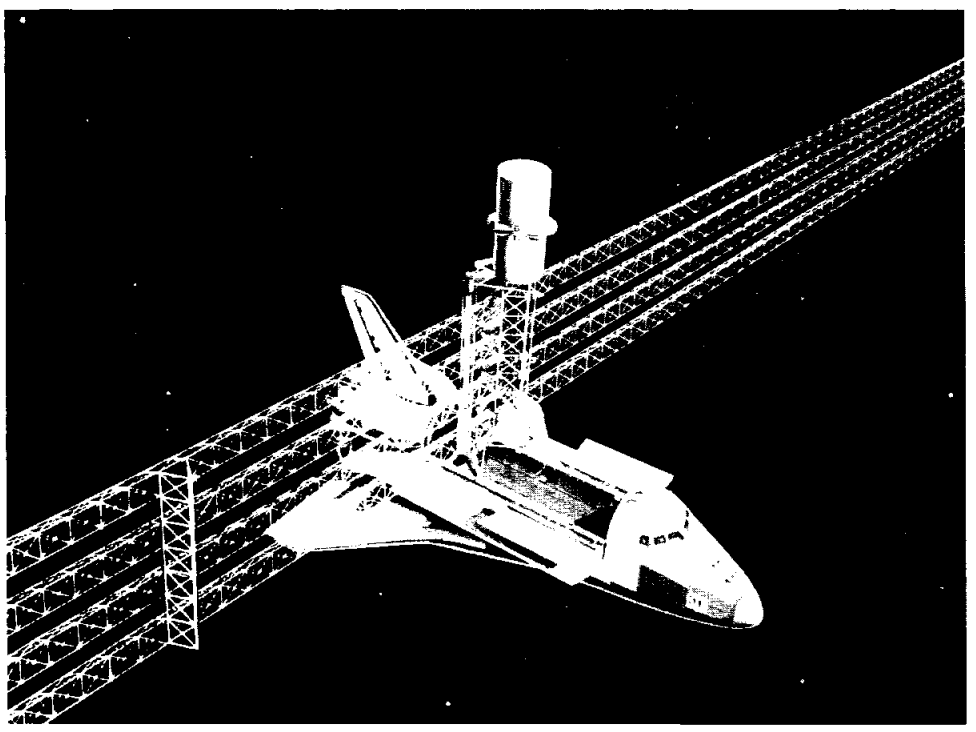
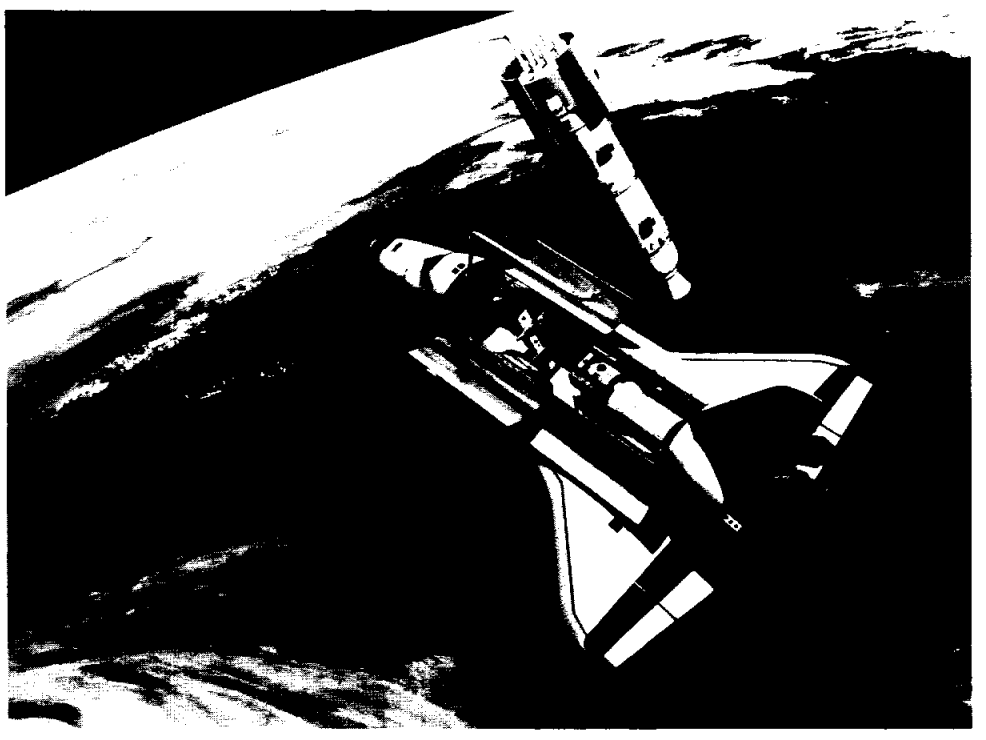


The Space Transportation System (Space Shuttle) will expand man's work environment into space. Pictured here are artists' conceptions of near future space program projects. Below, a beam builder fabricates a cross member to be joined with a large structure in Earth orbit. The Shuttle would serve as both a means of transportation and a workbase for construction. Bottom right, an orbiter carries multiple payloads. The Shuttle will be capable of both deploying and retrieving satellites and other space hardware. Top right is a possible manned, modularized space station in Earth orbit. The modules would be carried into space by the Shuttle. These modules would house personnel, as well as equipment and working areas for the space station.





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