Within this Decade: America in Space – 1969

Narrator: When did the exploration of space begin? At what time did man first conceive the journey to the Moon? For thousands of years, the astrologers, the philosophers, the writers of fiction have dreamed of such a journey, a long, impossible dream. But soon the dream will come true. In this sixth decade of the twentieth century, the first men will land and walk upon the surface of the Moon.

The journey to the Moon is not an isolated event. It is the result of a decade of search and discovery in space exploration. At NASA research centers, scientists, engineers, and technicians developed and tested new families of scientific satellites. Unmanned spacecraft, which would extend man's senses where he could not yet see, or hear, or touch, spacecraft which took scientific equipment and experiments into the unknown darkness and sent back the light of new knowledge. From these satellites, man has learned the nature of microscopic particles in space, he has measured air density at great altitudes, discovered how electrons deflect radio waves in the ionosphere, and where radiation belts encircle our planet. He has determined the true shape of the Earth and mapped it more precisely, made new measurements of solar energy, and sent telescopes into the night for a first clear look at the stars. Some were joint efforts to add to man's knowledge, the combined scientific quest of other nations and the launch technology of our own. The early scientific satellites carried only instruments into space. Later they would carry life, plants and animals, ranging from microorganisms to primates. These biosatellites told us how weightlessness, radiation, velocity, and pressure affected life in the new environment called space.

As man learned more about the Earth and near space, he sought to know about his neighbors in the solar system. Probes were hurled through interplanetary space to the neighborhood of Venus and Mars. Nearing Venus, our spacecraft reported the atmosphere to be very dense, the surface hot enough to melt lead. These investigations told scientists that on Venus there is little likelihood of life as we know it.

NASA also sent deep space probes sailing across uncharted seas, more than 360 million miles, to look for a brief but wondrous moment at our nearest planetary neighbor, Mars. We learned that Mars is probably more like the Moon than Earth, pock-marked with craters, with little or no magnetic field or gravity. As important as the return of scientific information was the new confidence gained in our technological maturity, that man could design and control such complex operations across millions of miles of interplanetary space.

Over the past decade scientists also developed complex new instruments to probe the intimate secrets of the long-mysterious Moon. Television cameras took us live and close-up to the lunar surface. Our spacecraft landed softly in the lunar seas. They examined the Moon's color and sampled its chemical composition. Man witnessed a sunset on the surface of the Moon, saw the Sun eclipsed by the Earth, and looked back at his own planet a quarter of a million miles away. Other spacecraft circled the Moon, photographing its yawning craters and soaring peaks, mapping more than 95 percent of its entire surface. These studies prove that man could land and walk upon the lunar soil.

In this first decade of the Space Age, the science and technology which was used to explore outer space was also applied to practical benefits here on Earth. Down-to-Earth satellites

provide a constant watch on the world's weather, serve as beacons for navigation by ship or plane, send voice and picture from any point on Earth to any other. In 10 years, we have come from a few experimental weather satellites to an operational system capable of night and day observations around the world. Today satellites take portraits of storms that span half a continent and transmit them to meteorologists in many nations. They have detected hurricanes and typhoons and given valuable hours of warning to those who live and work in their pathways.

Man has also learned to communicate by satellite, first with a great balloon that served as a reflector in the sky for earthbound transmitters. For most of the past decade, they provided millions around the world with their first glimpse of a man-made star zooming across the sky. Other satellites followed that could perform increasingly complicated communication tasks. Today the technology proved out by these first families of satellites has been put to commercial use in an operational system which is available not only to television networks and businesses but to people everywhere. All the world has been united to witness historic moments. Communication satellites have provided a valuable bridge to scientists working at distant points in the world.

But space research was not the only mission of NASA. The first "A" in the name of this new organization stands for aeronautics. An airplane without wings, the lifting body. Someday such a vehicle may be used to bring man back from space, through the fiery reentry of the Earth's atmosphere to a landing on the runway of tomorrow's airport. In 10 years, the field of aeronautics has kept pace with man's desire to fly ever higher, faster, and farther. Research has gone forward in jet noise, sonic boom, and aircraft safety. Hypersonic aircraft have been designed and built to fly to the dark edges of space. But the journey to the edge of space was not far enough. Man needed bigger rockets with greater power, the ability to cross the threshold of space for himself. In the 1960s, manned space travel became a reality.

Many men here on Earth helped ready the systems which would take a few men across that frontier. The astronauts, star sailors on a formidable sea, conditioned themselves for the new phenomena of space. Then came the day when the first man was ready. Astronaut Alan Shepard became the first American to enter space.

Capsule Communicator (CAPCOM): Five, four, three, two, one. Ignition.

Alan Shepard: Ah, Roger. Lift-off and the clock is started.

CAPCOM: Okay, José, you're on your way!

CAPCOM: Lift-off… [Unintelligible]

Alan Shepard: Yes sir, reading you loud and clear.

CAPCOM: Roger and you.

Narrator: Many astronauts would follow on longer voyages into space. John Glenn, first American to orbit the Earth. The experience of each added more knowledge to the textbook for all of those who would come after them.

CAPCOM: [Overlapping system confirmations]

CAPCOM: 3, 2, 1, zero.

John Glenn: Roger. The clock is operating. We're underway.

CAPCOM: Hear loud and clear.

John Glenn: Roger. We're programming in roll okay. Little bumpy along about here.

CAPCOM: Standby for 20 seconds.

John Glenn: Roger.

CAPCOM: Mark.

John Glenn: Roger. Backup clock is started.

Narrator: From these first flights came important information about the men, their spacecraft, and the facilities and personnel who supported them. Man could withstand the force of gravity many times his own weight. Man could live for extended periods weightless in the vacuum of space. Man could maneuver his own spacecraft in orbit, make scientific measurements, take photographs of the space around him and the Earth below.

CAPCOM: Gemini VI, Houston is standing by.

Thomas Stafford: Roger. We have 120 feet steady.

CAPCOM: Roger. Understand. Station keeping at 120 feet.

Narrator: Man could locate other spacecraft hundreds of miles across the ocean of space.

CAPCOM: Gemini IX, Hawaii.

Thomas Stafford: How are ya? I've got a weird looking machine here.

CAPCOM: What does it look like?

Thomas Stafford: The jaws are just like an alligator's jaw that's open and it looks like they're fully extended.

CAPCOM: Roger.

CAPCOM: Okay, we have a rigid light. Okay Gemini VIII, it looks good here from the ground. We're showing column rigid. Everything looks good for the docking.

Neil Armstrong: Agena was very stable, and at the present time we're having no noticeable oscillations at all.

Narrator: Man could rendezvous and dock with spacecraft sent into orbit ahead of him.

CAPCOM: Roger. Copy. Agena very stable and no noticeable oscillations.

Neil Armstrong: Okay, we're going to cycle our stop on switch now.

CAPCOM: Roger.

Neil Armstrong: Flight, we are docked.

Narrator: Man could perform complex scientific and technological experiments in space. Man could walk and work outside his spacecraft.

These first steps into space had taken man hundreds of miles above Earth. Yet he dreamed of more distant and demanding voyages, expeditions which would require bigger rockets and more sophisticated spacecraft, larger crews and longer times. And so man began his preparations for the Moon. And the nation was ready to meet the challenge.

Behind the spacemen have stood thousands of engineers, scientists, and technicians, all part of the team dedicated to building and testing the many components which contributed to the dream. America called upon its industry and its institutions, placed new demands and offered new challenges to the establishments of our time. Education contributed ideas and experiments, scientific expertise, and manpower. Industry solved thousands of insoluble problems, found new methods and new materials when they were needed, achieved new heights in quality control and rates of performance.

Sometimes there were failures and accidents that claimed men's lives. The astronaut pilot of this research vehicle landed safely.

But we corrected the faults and continued the work to be done.

Youth witnesses the culmination of a dream. Here in this building at the Kennedy Space Center, the mighty Saturn V rocket is readied. This is the vehicle which will thrust three Americans toward the Moon in the greatest voyage of this century.

The great adventure begins here at one mile per hour, a giant slowly and ponderously inching its way toward the pad, carrying with it the plans and performances of multitudes of people.

A series of test flights with the Saturn V rocket was essential to man's landing on the Moon.

CAPCOM: 18, 17, 16, 15, 14, 13, 12, 11, 10, 9. Ignition sequence starts. 5, 4. We have ignition.

Narrator: The rehearsal began with Apollo 8. Three days and 238,000 miles away from Earth, the pioneers of Apollo 8 came face to face with the lunar landscape.

Bill Anders: In the beginning God created the Heaven and the Earth. And the Earth was without form, and void, and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters. And God said, "Let there be light." And there was light.

[Continuing in background] *And God saw the light, that it was good, and God divided the light from the darkness.*

Narrator: These men were the first to orbit the Moon, to go where man had never gone before, to see sights which man had never beheld

Jim Lovell: And God called the light Day, and the darkness he called Night. And the evening and the morning were the first day. And God said, "Let there be a firmament in the midst of the waters, and let it divide the waters from the waters." And God made the firmament, and divided the waters –

[Continuing in background] – *which were under the firmament from the waters which were above the firmament. And it was so. And God called the firmament Heaven.*

Narrator: It was Christmas back on Earth, but this was the time when both the Earth and the Moon were in the right places and this was the opportune moment.

Jim Lovell: And the evening and the morning were the second day.

Frank Borman: And God said, "Let the waters under the Heaven be gathered together unto one place, and let the dry land appear." And it was so. And God called the dry land Earth, and the gathering together of the waters called He Seas. And God saw that it was good. And from the crew of Apollo 8, we close with good night, good luck, a Merry Christmas, and God bless all of you, all of you on the good Earth.

Narrator: Three months later came the second manned mission in the Saturn V rocket, the Earth orbital flight of Apollo 9, to test further the men and the new machine called the Lunar Module. Despite illness and anxious moments, the mission was successful. The Command and Lunar Modules could separate across the vastness of space and could come safely together again.

Astronauts / CAPCOM: [Inaudible conversation]

Narrator: The next act in the prologue to lunar landing was Apollo 10. Two of the astronauts entered the Lunar Module and took it down to within 50,000 feet of the lunar surface. The final and most critical tests were completed successfully. The Sea of Tranquility now awaits the arrival of the first men from Earth.

Astronaut 1: Quantity monitor, descent.

Astronaut 2: Descent.

Astronaut 1: Medium monitor select switch to supercritical position.

Astronaut 2: Supercritical.

Narrator: Three men will make the journey: astronauts Neil Armstrong, Edwin Aldrin, and Michael Collins. They will share some of the experiences of those who preceded them: a launching, Earth orbit, rendezvous and docking, lunar orbit, separation of the Command and Lunar Modules. Astronaut Collins will remain aboard the Command Module in lunar orbit. Astronauts Armstrong and Aldrin will land on the Moon. Here on Earth, they have rehearsed the activities they will perform. The men are ready. The machines are ready. Now we know the dream will be achieved; the challenge will be met. In 10 short years, we have come a long way, but man's journey into space has just begun.

John F. Kennedy: I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth. No single space project in this period will be more impressive to mankind or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish. But in a very real sense, it will not be one man going to the Moon – if we make this judgment affirmatively, it will be an entire nation.