

# Langley Research Center

1917 ☆ FIFTY YEARS OF SERVICE TO THE NATION ☆ 1967

## LANGLEY RESEARCH CENTER CONTRIBUTES TO EFFORTS OF NASA DURING FIRST FIVE YEARS TO ADD TO KNOWLEDGE OF UNIVERSE

The law which established the National Aeronautics and Space Administration on October 1, 1958, required that NASA "...provide for research into problems of flight within and outside the Earth's atmosphere, and for other purposes." The former National Advisory Committee for Aeronautics, including the Langley Research Center, became the nucleus of the new organization.

Continuing goals set forth by the President and the Congress include: unmanned lunar and planetary exploration; development and application of communications and weather satellites; development of launch vehicles and propulsion systems; extended aeronautical research; expansion of knowledge relating to space and how man can adapt to it; and international cooperation in space research.

Space exploration became a major instrument of national policy with President Kennedy's statement to Congress on May 25, 1961, "...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 Earth."

Achievements: With more than 100 major launches the first five years, NASA has sent into space weather satellites, deep space probes, communications satellites, manned orbital space flights, and made numerous scientific discoveries. Thousands of sounding rockets have been launched to study the atmosphere. People the world over, and especially Americans, now know the Earth is somewhat pear-shaped rather than a perfect sphere. They have heard about and have some knowledge of the X-15 research airplane; the Van Allen radiation belts; man-made satellites; Echo, Telstar, Relay and Syncom; Mariner and Venus fly-by.

Man-In-Space: Project Mercury, the first of three phases in achieving the nation's objective to reach the Moon, was successfully completed with the 22-orbit flight of Astronaut L. Gordon Cooper on May 15-16, 1963. The Mercury project came out of pioneering work at the Langley Research Center, Hampton, Virginia, and grew into a truly national effort by the time John H. Glenn Jr. made his historic three-orbit flight February 20, 1962. The next two phases

to the Moon are the Gemini and Apollo projects.

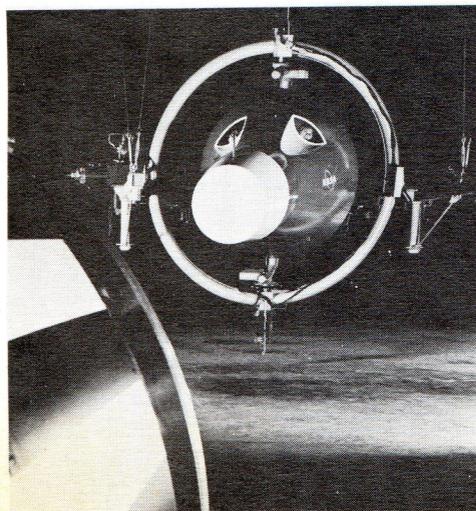
Flight to Venus: The flight of Mariner II was of major scientific significance. Launched August 27, 1962, it flew by Venus December 14, 1962, extending the space communications record to 54.7 million miles. It transmitted to Earth vast amounts of data about Venus and interplanetary space. Follow-on programs will attempt to scan Mars. NASA impacted the Moon with the Ranger IV, launched April 23, 1962. Although the scientific objectives were not achieved, the flight helped prove the technology of an Earth "parking orbit."

Weather Satellites: The first direct benefit to mankind from space technology came with the highly successful meteorological satellites. The TIROS (for Television Infrared Observation Satellite) has photographed vast cloud formations and provided early warnings of hurricanes. The first of a series of seven TIROS was launched April 1, 1960. TIROS VII was launched June 19, 1963.

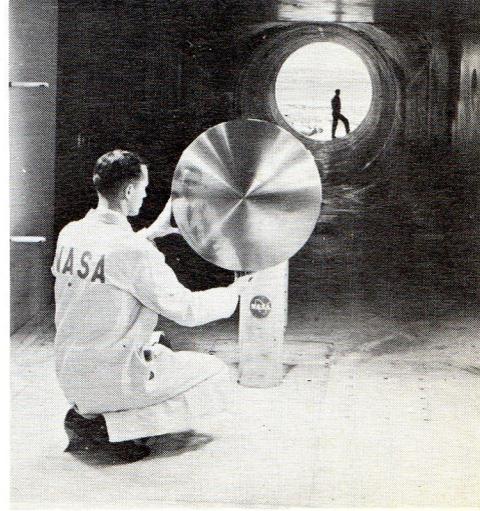
Communications Satellites: Telstar I was launched by NASA July 10, 1962-- the first of the active communications satellites. Linking two continents, it transmitted voice, teletype, photos, and television. It was followed promptly by NASA's Relay I which linked three continents. Both proved the feasibility of an "orbiting switchboard" for communications between continents. NASA's experimental Syncom II, launched July 26, 1963, gave promise of a truly operational communications system.

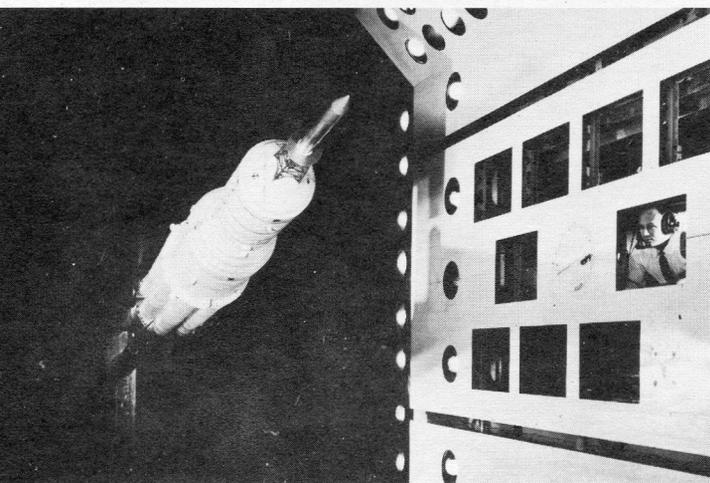
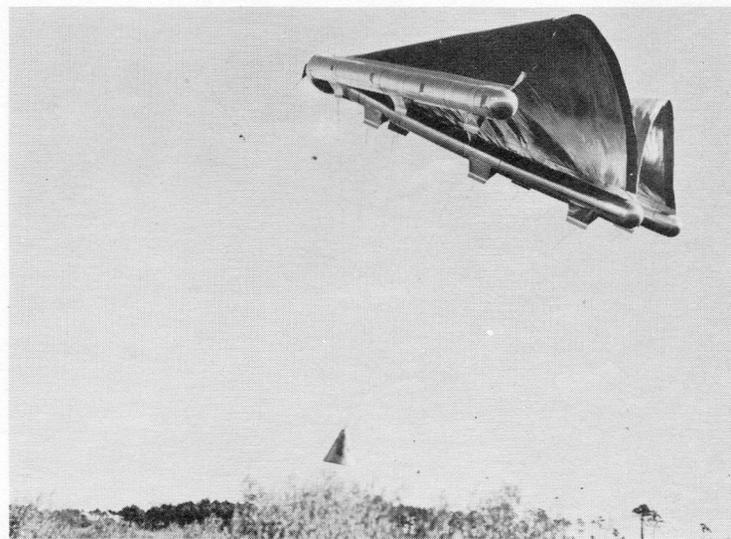
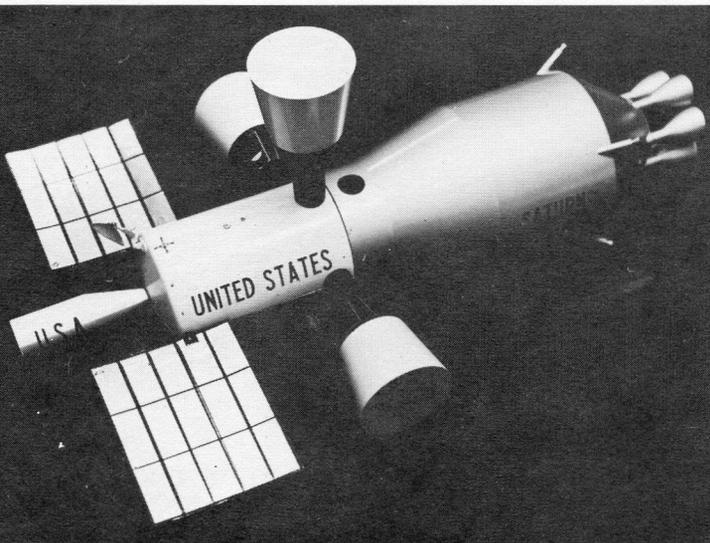
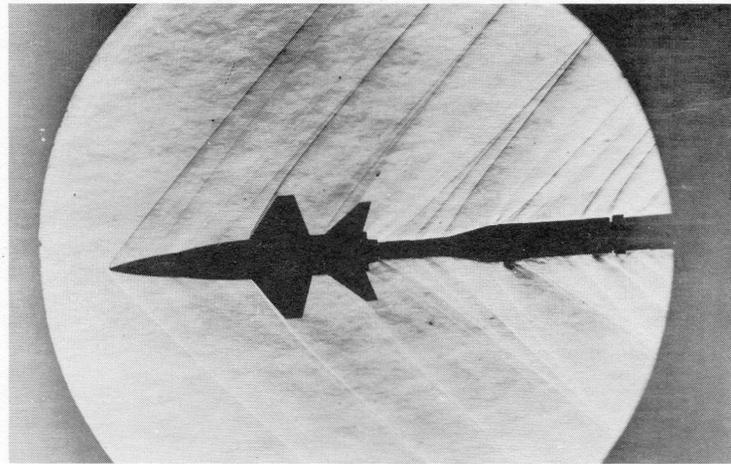
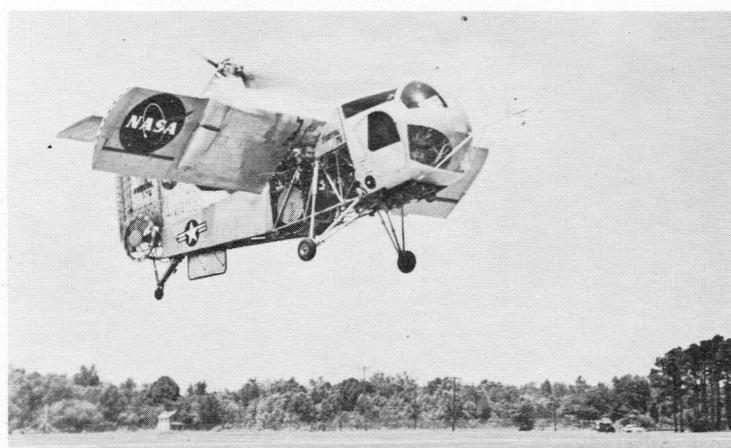
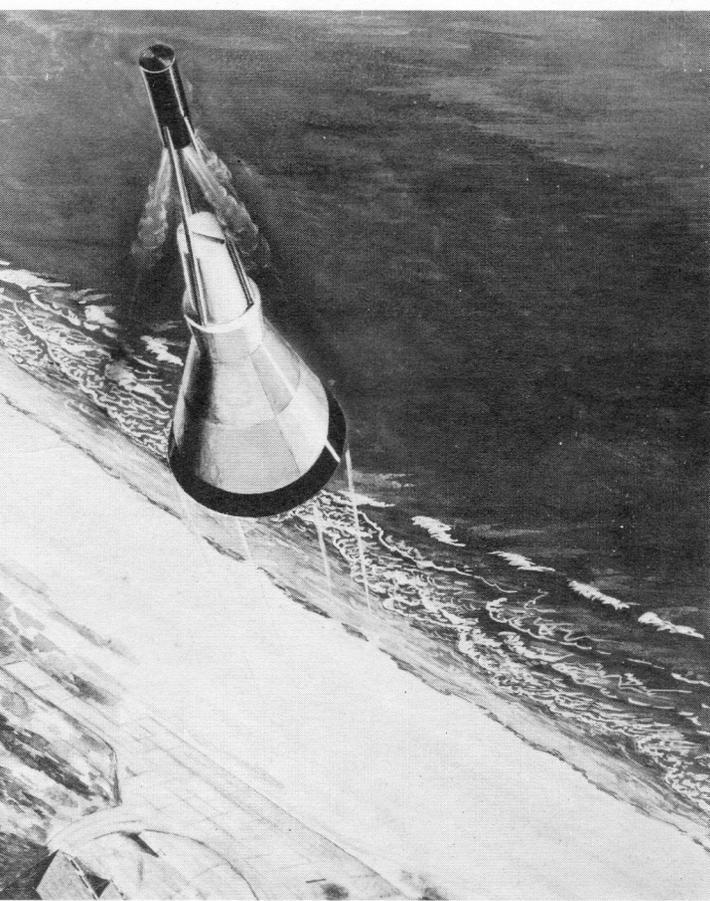
Aeronautical Research: NASA has continued a broad program of aeronautical research and flight testing to assist the design and development of civil and military aircraft. Scope of the work ranges from helicopters to the fringe of space. A stepped-up research program is supporting the national effort for a supersonic commercial air transport.

Scientific Knowledge: In five years of NASA, scientists have gone well beyond the realm of science fiction in devising a variety of space vehicles. From these and others yet on the drawing boards will come greater knowledge of the universe, greater knowledge of the Earth's atmosphere, and even greater knowledge of the Earth.

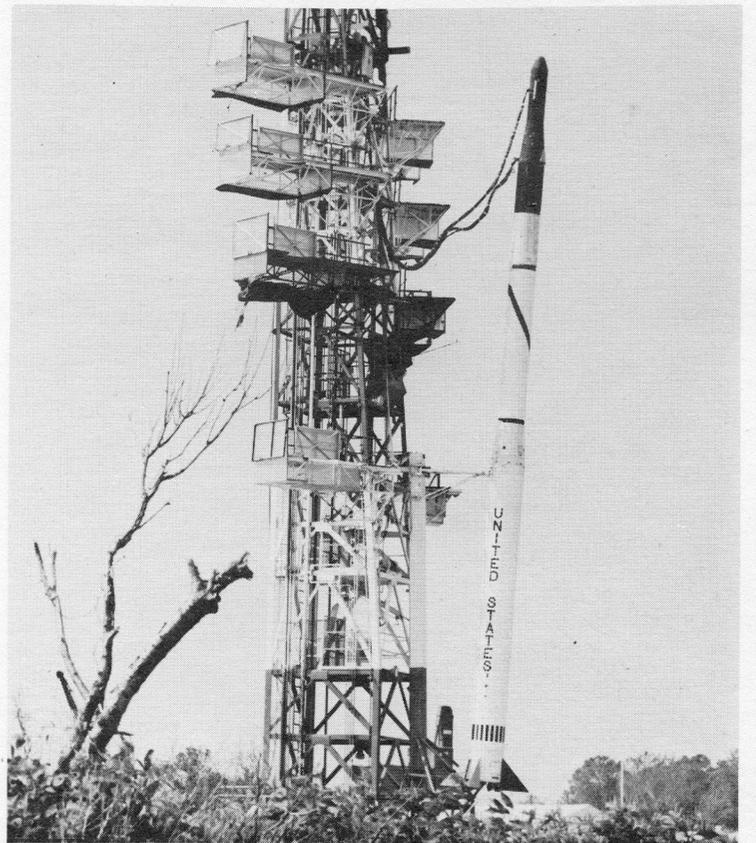
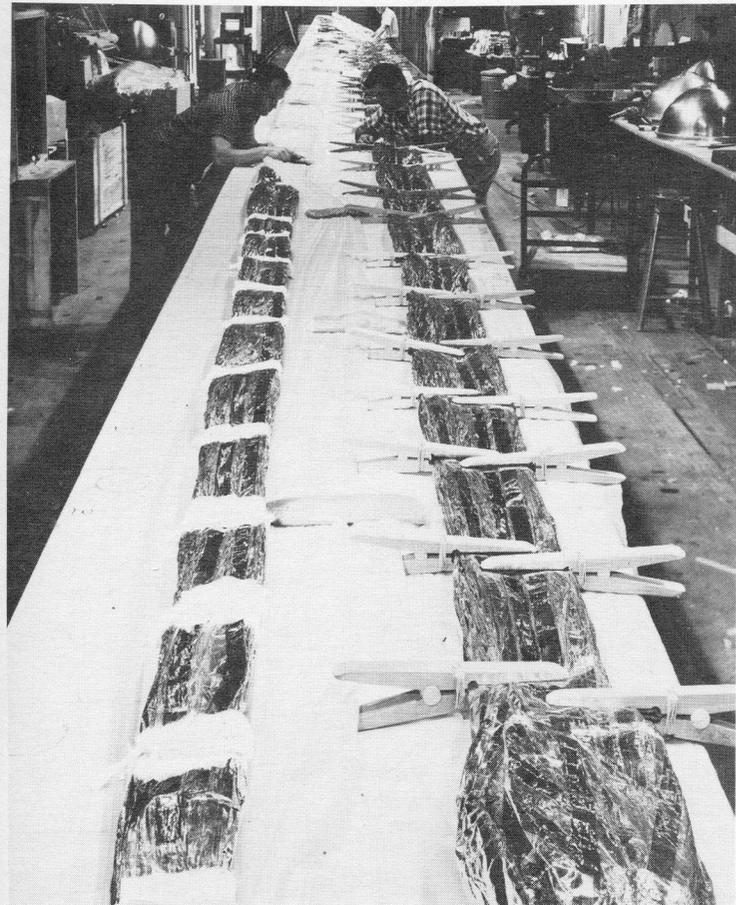
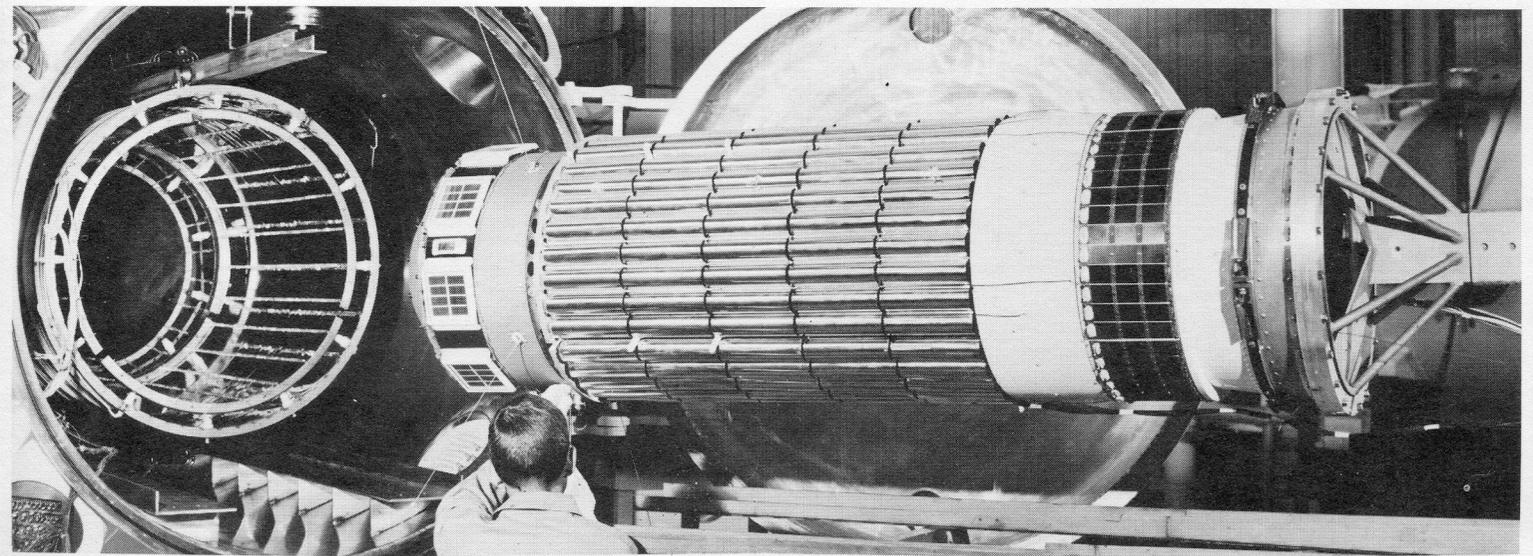


SPACE VEHICLE Rendezvous Docking Facility (left) provides information for Gemini flights; Project FIRE model test (right) is preliminary to flight to obtain lunar mission reentry data; Langley concept (above) is subject of research in national effort to develop a 2,000 mph commercial transport.





ARTIST'S CONCEPT (top left) depicts a flight test of a spacecraft escape system, one of a number of scientific investigations conducted by Langley in support of Project Mercury. Typical of current space research are basic studies of a proposed manned orbital laboratory (center left), wind tunnel buffeting tests of a Saturn-Apollo model with escape system (lower left), and free-flight tests of the paraglider as a recovery system for space vehicles. Langley has conducted a variety of aeronautical research, including development studies on the X-15-- a model of which is shown undergoing stability, control, and aerodynamic performance tests in a wind tunnel (center right) as shock waves are recorded through use of special photography. The vertical takeoff-landing concept (top right) with rotating wing is one of several VTOL aircraft flown by Langley research pilots.



EXPLORER XVI, which provided extensive information on the penetration hazard of micrometeoroids-- particles of various sizes that travel through space at high velocities-- is prepared for a pre-flight test in a vacuum chamber (top). Explorer XVI was launched at Wallops Island, Virginia, by a four-stage Scout. The Langley-developed Scout (center right) is the first all-solid fueled launch vehicle to propel a satellite-- the inflatable 12-foot polka-dot Explorer IX-- into orbit. Explorer IX is relaying data on atmospheric drag. Two 12-foot spheres (right) are shown in a Laboratory at Langley. Preliminary to the launching into orbit of Echo I, technicians at Langley work on two 100-foot balloons to determine the proper technique for folding them. Echo I was carried aloft folded inside a 26-1/2-inch metal container and automatically ejected and inflated in space.

