



**JOHN F. KENNEDY
SPACE CENTER**

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university of alabama in huntsville
saturn history
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1969

Quarterly Supplement #1
GP 381

A Summary of
MAJOR NASA LAUNCHINGS

Eastern Test Range
(ETR)

Western Test Range
(WTR)

OCTOBER 1, 1968 -- DECEMBER 31, 1968

Historical and Library Services Branch
John F. Kennedy Space Center
National Aeronautics and Space Administration
Kennedy Space Center, Florida

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FOREWORD

This is the first Quarterly Supplement to the October 1968 edition of GP 381, "A Summary of Major NASA Launchings (Eastern Test Range and Western Test Range)." This Supplement covers the period from October 1 to December 31, 1968. Two additional Quarterly Supplements will be issued during 1969. Each of these will list those major NASA launchings occurring during the three-month period it covers. The basic publication will be revised and reissued, incorporating the information contained in the Supplements, as well as covering the final three-month period, subsequent to October 1, 1969.

The basic sources for information contained in these Supplements are: (a) Operations Summaries and Flash Flight Reports, issued by the Kennedy Space Center organizational element concerned with a launch; and, (b) the Pre-Launch and Post-Launch Mission Operation Reports, prepared, issued, and distributed by the Program and Special Reports Division, Executive Secretariat, NASA Headquarters. Orbital parameters are obtained either from the above sources, or from the Satellite Situation Reports issued periodically by the Goddard Space Flight Center. For ease of understanding, distances are given in statute miles, times are Eastern (Standard or Daylight) Time, and velocities are in miles-per-hour.

Designation of a mission as a success (S), or as unsuccessful (U), reflects the decision of the appropriate NASA Associate Administrator concerning that mission, as contained in the pertinent Post-Launch Mission Operation Report. In some instances, where the duration of a mission extends beyond the period covered by a Supplement, no designation of success or failure is given.

Comments, criticisms, and suggestions for the improvement of content, format, and usefulness of this publication are solicited. Correspondence should be addressed to: Historical and Library Services Branch (IS-CAS-4), John F. Kennedy Space Center, NASA; Kennedy Space Center, Florida 32899.

William A. Lockyer, Jr.

GEOPHYSICS AND ASTRONOMY PROGRAMS
(continued)

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>JOINT PROGRAMS</u>					
HEOS-A	5 Dec 68	Delta DSV-3E (Delta-61)	HEOS-A	ETR 17B	NASA launch; non-NASA mission. HEOS (Highly Eccentric Orbit Satellite), the first satellite produced by the European Space Technology Center for the European Space Research Organization (ESRO), carried eight experiments to obtain information on magnetic fields, cosmic radiation, and solar winds from an area beyond the magnetosphere and the shock wave of the Earth. Launched at 1355 (1:55 PM) EST, the 237-pound, 16-sided spacecraft was successfully injected into an elliptical orbit with an apogee of 138,831 and a perigee of 263 statute miles at an inclination of 28 degrees. Following verification of orbit, spacecraft control was turned over to the ESRO Operations Center where seven of the eight experiments were activated on December 11, 1968. (Eighth experiment to be activated approximately two months after launch.) (S)

GEOPHYSICS AND ASTRONOMY PROGRAMS

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>ORBITING ASTRONOMICAL OBSERVATORY (OAO)</u>					
OAO-II	7 Dec 68	Atlas-Centaur (AC-16)	OAO-A2	ETR 36B	Lifting off at 3:40 AM EST, the launch vehicle successfully injected the 4,400-pound spacecraft into a near-circular orbit with an apogee of 482 and a perigee of 478 statute miles at an inclination of 35 degrees to the equator. A total of 11 telescopes are carried on the spacecraft, divided among two experiment packages provided by the University of Wisconsin and the Smithsonian Astrophysical Observatory with the objective of making precision observations from above the Earth's atmosphere in the relatively unexplored ultraviolet region of the spectrum. Following an intensive functional checkout of the spacecraft and the experiments, both experiment packages are performing successfully. Still in orbit; still transmitting. (S)

METEOROLOGICAL EARTH SATELLITES

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>ENVIRONMENTAL SURVEY SATELLITES (ESSA)</u>					
ESSA VIII	15 Dec 68	Delta DSV-3N (Delta-62)	TOS-F	WTR SLC-2E	The eighth spacecraft in the TIROS Operational Satellite (TOS) series was successfully launched at 0921 PST (1221 EST). The two-stage launch vehicle first injected the second stage and spacecraft into a transfer orbit, then after a coast period, the second stage was restarted and placed the spacecraft into the desired mission orbit with an apogee of 903 and a perigee of 875 statute miles at an inclination of 101 degrees. This retrograde, sun-synchronous, near-polar orbit provides maximum coverage of the illuminated Earth. The 18-sided, 300-pound, spin-stabilized spacecraft carries two Automatic Picture Transmission (APT) camera systems to transmit real-time television pictures of Earth's cloud cover. Both cameras performed as expected. Spacecraft was turned over to ESSA for operational use on December 24 following engineering checkout by NASA. (S)

COMMUNICATIONS AND NAVIGATION PROGRAM

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>COMMERCIAL (COMSAT. CORP.)</u>					
Intelsat III	18 Dec 68	Delta DSV-3M (Delta-63)	F-2	ETR 17A	Successfully launched by NASA for Comsat Corporation at 1932 (7:32 PM) EST into a temporary elliptical orbit with an apogee of 22,820 and a perigee of 163 statute miles at an inclination of 30 degrees. Following orientation of the spacecraft's attitude, its apogee kick motor was fired by ground command at 0916 EST December 20 to begin maneuvering it into a synchronous orbit over the Atlantic Ocean and the equator between 25-30 degrees West longitude. On December 30, 1968, Intelsat III F-2 had an apogee of 22,226 and a perigee of 22,213 statute miles, with a period of 23 hours, 55 minutes, and 54 seconds. The satellite had an Eastward drift of six-tenths of a degree per day, and all systems were functioning normally. The second of the Intelsat III series (but the first to be successfully orbited), the 632-pound, cylindrical spacecraft has the capability of handling 1200 two-way voice channels or four television channels, and relayed commercial television coverage of the Apollo 8 mission. (S)

SCIENTIFIC DEEP SPACE AND PLANETARY PROBES

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>PIONEER</u>					
Pioneer IX	8 Nov 68	Delta DSV-3E (Delta-60)	Pioneer-D	ETR 17B	Launched from Cape Kennedy at 0446 EST. Count-down was normal except for a nine-minute unscheduled hold to evaluate high-altitude wind shear data against vehicle capabilities. Pioneer IX was injected into a solar orbit with an aphelion of 92,091,837 and a perihelion of 70,061,186 statute miles, and a 297.5-day period. The 147-pound, cylindrical, spin-stabilized spacecraft carried seven scientific experiments, provided by universities, industry and NASA to obtain data on the properties of the solar wind, cosmic rays, and interplanetary magnetic fields. The launch vehicle also carried a 44-pound secondary payload, a MSFN Test and Training Satellite (TETR-B), which was injected into Earth orbit. (S)

PROJECT APOLLO (FLIGHTS AND TESTS)

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>MANNED SPACE FLIGHT NETWORK TEST AND TRAINING SATELLITES</u>					
Test and Training Satellite	8 Nov 68	Delta DSV-3E (Delta-60)	TETR-B	ETR 17B	Launched from Cape Kennedy at 0446 EST as a secondary (piggyback) payload attached to the second stage of the Delta vehicle that successfully injected Pioneer IX into solar orbit. The 44-pound, eight-sided spacecraft is an Orbiting Relay Satellite III (ORS-III) model of the Environmental Research Satellite series. It carries an S-band transponder to provide an active target for ground tracking by MSFN ground stations. The spacecraft was launched as a replacement for the first MSFN Test and Training Satellite (TTS-1), which re-entered the atmosphere on April 28, 1968. (S)

PROJECT APOLLO (FLIGHTS AND TESTS)

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>ORBITAL (MANNED)</u>					
Apollo 7	11 Oct 68	Saturn IB	AS-205/ CSM-101	ETR 34	First manned Apollo flight; first manned Saturn IB flight; first manned launch from Launch Complex 34. (Astronauts Walter M. Schirra, command pilot; Donn F. Eisele, command module pilot; R. Walter Cunningham, lunar module pilot.) Liftoff at 1102:45 EDT was two minutes, 45 seconds later than planned, due to a brief hold to check second stage engine chilldown. A total of 66,850 pounds consisting of the second (S-IVB) stage, the instrument unit (IU), the spacecraft lunar module adapter (SLA), and the command and service module (CSM), were injected into Earth orbit. After a brief coast period, the S-IVB stage was restarted, placing the attached spacecraft into a higher orbit. Later the CSM was separated and performed rendezvous and station-keeping maneuvers, approaching within 70 feet of the spent S-IVB. Extensive checkout of spacecraft systems was performed during the course of the mission. A total of eight service propulsion system (SPS) firings were accomplished, and several changes in orbital path were made. The final SPS burn was a deorbit retrofire. The command module separated from the service module prior to re-entry, landing in the Atlantic about seven miles from the target point at 0711 EDT on October 22, after a flight of 260 hours, 9 minutes (10.8 days). Seven television transmissions from the spacecraft were broadcast live over commercial television, both in the U. S. and abroad. While in orbit all three astronauts developed colds, without any apparent aftereffects. (S)

PROJECT APOLLO (FLIGHTS AND TESTS)

(continued)

<u>Name</u>	<u>Date</u>	<u>Launch Vehicle</u>	<u>NASA Code</u>	<u>Site/Pad</u>	<u>Remarks/Results</u>
<u>LUNAR (MANNED)</u>					
Apollo 8	21 Dec 68	Saturn V	AS-503 CSM-103 LTA-B	ETR (KSC) 39A (LUT-1)	Launched at 0751:00.7 EST into a 118-114 statute mile Earth parking orbit (to check spacecraft and ground systems). During second orbit, at 1041:31, the S-IVB stage engine was reignited, boosting the space vehicle from 17,434 mph to an initial trans-lunar coast velocity of 24,593 mph. The spacecraft and the S-IVB then separated and the S-IVB was sent on a path away from the spacecraft and into solar orbit. The spacecraft's lunar trajectory required only minor midcourse corrections. At 1529 EST Dec. 23, when 202,854 miles from Earth and 38,920 miles from the Moon, Apollo 8, whose coast velocity had slowed to about 2,223 mph, left the region in which the gravitation of Earth is dominant and entered that in which the Moon's prevails. Apollo 8 passed ahead of the Moon at an altitude of about 71 miles and a speed of about 5,720 mph, and at 0459 Dec. 24, while on the far side of the Moon, the spacecraft's engine was fired to insert it into a 194-74 mile lunar orbit. On the second revolution the engine was fired again to circularize the orbit at about 70 miles. During 10 lunar revolutions the astronauts took star sights to pinpoint landmarks, surveyed landing sites, took both still and motion pictures, and made two television transmissions to Earth. At 0110 Dec. 25, on the far side of the Moon, the spacecraft's engine was ignited to accelerate it out of lunar orbit. Initial transearth coast velocity was about 6,035 mph and only one mid-course correction was needed. At 1022 EST Dec. 27, about 10,357 miles from Earth, the command and service modules separated, and fifteen minutes later the command module re-entered Earth's atmosphere at a speed of 24,243 mph. Apollo 8 landed in the Pacific at 1051 EST Dec. 27, 5,000 yards from the recovery ship, USS Essex, after a flight of 147 hours. (S)
<u>Apollo 8 Astronauts</u>					
Frank Borman (spacecraft commander), James A. Lovell, Jr., William A. Anders					
<u>Apollo 8 Weights</u>					
Total weight - space vehicle on pad - 6,219,760 lb. Weight in Earth orbit - spacecraft, IU, S-IVB - 282,000 lb. Weight following translunar injection - 63,650 lb.					
<u>Apollo 8 Firsts</u>					
World's first manned flight to Moon; first manned flight to orbit the Moon; first manned flight to escape the influence of Earth's gravity; fastest and furthest man has travelled in space to date; first audio-video communication by astronauts from lunar distance (6 TV transmissions: 2 enroute, 2 in lunar orbit, 2 during return); first manned Saturn V flight; first manned launch from Launch Complex 39, KSC; first manned spacecraft landing in darkness.					