

# A Chronology of Mars Exploration

**Mars 1960A** - USSR Mars Probe - (October 10, 1960)

- Failed to reach Earth orbit.

**Mars 1960B** - USSR Mars Probe - (October 14, 1960)

- Failed to reach Earth orbit.

**Mars 1962A** - USSR Mars Flyby - (October 24, 1962)

- Spacecraft failed to leave Earth orbit after the final rocket stage exploded.

**Mars 1** - USSR Mars Flyby - 893 kg - (November 1, 1962)

- Communications failed en route.

**Mars 1962B** - USSR Mars lander - (November 4, 1962)

- Failed to leave Earth orbit.

**Mariner 3** - USA Mars Flyby - 260 kg - (November 5, 1964)

- Mars flyby attempt. Solar panels did not open, preventing flyby. Mariner 3 is now in a solar orbit.

**Mariner 4** - USA Mars Flyby - 260 kg - (November 28, 1964 - December 20, 1967)

- Mariner 4 arrived at Mars on July 14, 1965 and passed within 6,118 miles of the planet's surface after an eight month journey. This mission provided the first close-up images of the red planet. It returned 22 close-up photos showing a cratered surface. The thin atmosphere was confirmed to be composed of carbon dioxide in the range of 5-10 mbar. A small intrinsic magnetic field was detected. Mariner 4 is now in a solar orbit.

**Zond 2** - USSR Mars Flyby - (November 30, 1964)

- Contact was lost en route.

**Mariner 6** - USA Mars Flyby - 412 kg - (February 24, 1969)

- Mariner 6 arrived at Mars on February 24, 1969, and passed within 3,437 kilometers of the planet's equatorial region. Mariner 6 and 7 took measurements of the surface and atmospheric temperature, surface molecular composition, and pressure of the atmosphere. In addition, over 200 pictures were taken. Mariner 6 is now in a solar orbit.

**Mariner 7** - USA Mars Flyby - 412 kg - (March 27, 1969)

- Mariner 7 arrived at Mars on August 5, 1969, and passed within 3,551 kilometers of the planet's south pole region. Mariner 6 and 7 took measurements of the surface and atmospheric

**Viking 1** - USA Mars Orbiter/Lander - 3,399 kg - (August 20, 1975 - August 7, 1980)

**Viking 2** - USA Mars Orbiter/Lander - 3,399 kg - (September 9, 1975 - July 25, 1978)

- Viking 1 and 2 were designed after the Mariner spacecraft. They consisted of an orbiter and lander. The orbiter weighed 900 kg and the lander 600 kg. Viking 1 was launched from the Kennedy Space Center, on August 20, 1975, the trip to Mars and went into orbit about the planet on June 19, 1976. The lander touched down on July 20, 1976 on the western slopes of Chryse Planitia (Golden Plains). Viking 2 was launched for Mars on November 9, 1975, and landed on September 3, 1976. Both landers had experiments to search for Martian micro-organism. The results of these experiments are still being debated. The landers provided detailed color panoramic views of the Martian terrain. They also monitored the Martian weather. The orbiters mapped the planet's surface, acquiring over 52,000 images. The Viking project's primary mission ended on November 15, 1976, eleven days before Mars' superior conjunction (its passage behind the Sun), although the Viking spacecraft continued to operate for six years after first reaching Mars. The Viking 1 orbiter was deactivated on August 7, 1980, when it ran out of altitude-control propellant. Viking 1 lander was accidentally shut down on November 13, 1982, and communication was never regained. Its last transmission reached Earth on 11 November 1982. Controllers at NASA's Jet Propulsion Laboratory tried unsuccessfully for another six and one-half months to regain contact with the lander, but finally closed down the overall mission on 21 May 1983.

**Phobos 1** - USSR Mars Orbiter/Lander - 5,000 kg - (July 7, 1988)

- Phobos 1 was sent to investigate the Martian moon Phobos. It was lost en route to Mars through a command error on September 2, 1988.

**Phobos 2** - USSR Phobos Flyby/Lander - 5,000 kg - (July 12, 1988)

- Phobos 2 arrived at Mars and was inserted into orbit on January 30, 1989. The orbiter moved within 800 kilometers of Phobos and then failed. The lander never made it to Phobos.

**Mars Observer** - USA Mars Orbiter (September 25, 1992)

- Communication was lost with Mars Observer on August 21, 1993, just before it was to be inserted into orbit.

**Mars Global Surveyor** - USA Mars Orbiter (November 7, 1996)

- The Mars Global Surveyor is scheduled for launch in the late fall of 1996. It was initiated due to the loss of the Mars Observer. The basic spacecraft design is after the Mars Observer.

**Mars 96** - Russia Orbiter & Lander - (November 16, 1996)

- Mars '96 consisted of an orbiter, two landers, and two soil penetrators that were to reach the planet in September 1997. The rocket carrying Mars 96 lifted off successfully, but as it entered orbit the rocket's fourth stage ignited prematurely and sent the probe into a wild tumble. It crashed into the ocean somewhere between the Chilean coast and Easter Island. The spacecraft sank, carrying with it 270 grams of plutonium-238.

**Mars Pathfinder** - USA Lander & Surface Rover - (December 1996)

- The Mars Pathfinder will deliver a stationary lander and a surface rover to the Red Planet in July 1997. The six-wheel rover, named Sojourner, will explore the area near the lander. The

mission's primary objective is to demonstrate the feasibility of low-cost landings on the martian surface. This is the second mission in NASA's low-cost Discovery series.

**Planet B - Japan Mars Orbiter - (August 1998)**

- Japan's Institute of Space and Astronautical Science (ISAS) will launch this probe to study the Martian environment. This will be the first Japanese spacecraft to reach another planet.

**Mars Surveyor '98 Orbiter - USA Orbiter - (December 1998)**

- This orbiter is the companion spacecraft to the Mars Surveyor '98 Lander. The spacecraft will study the planet from polar orbit for at least 1.9 years using a variety of advanced instruments.

**Mars Surveyor 98' Lander - USA Lander - (January 1999)**

- The lander is the companion spacecraft to the Mars Surveyor '98 Orbiter. The spacecraft will study the environment at the martian south pole, seeking to understand planet's climate and soil. It will be equipped with meteorological equipment to study the weather and a robotic arm to dig trenches in the soil.

**Mars Surveyor 2001 - USA Mars Probe - (2001)**

- This is part of NASA's 10-year program to launch a series of probes to the Red Planet during periods of favorable launch opportunities.

**Mars Surveyor 2003 - USA Mars Probe - (2003)**

- This is part of NASA's 10-year program to launch a series of probes to the Red Planet during periods of favorable launch opportunities.

**Mars Surveyor 2005 - USA Mars Sample Return - (2005)**

- This mission will return soil samples for analysis on Earth.

Roger D. Launius, NASA Code ZH, July 4, 1997

temperature, surface molecular composition, and pressure of the atmosphere. In addition, over 200 pictures were taken. Mariner 7 is now in a solar orbit.

**Mariner 8** - USA Mars Flyby - (May 8, 1971)

- Failed to reach Earth orbit.

**Kosmos 419** - USSR Mars Probe - (May 10, 1971)

- Failed to leave Earth orbit.

**Mars 2** - USSR Mars Orbiter/Soft Lander - 4,650 kg - (May 19, 1971)

- The Mars 2 lander was released from the orbiter on November 27, 1971. It crashed-landed because its braking rockets failed - no data was returned and the first human artifact was created on Mars. The orbiter returned data until 1972.

**Mars 3** - USSR Mars Orbiter/Soft Lander - 4,643 kg - (May 28, 1971)

- Mars 3 arrived at Mars on December 2, 1971. The lander was released and became the first successful landing on Mars. It failed after relaying 20 seconds of video data to the orbiter. The Mars 3 orbiter returned data until August, 1972. It made measurements of surface temperature and atmospheric composition.

**Mariner 9** - USA Mars Orbiter - 974 kg - (May 30, 1971 - 1972)

- Mariner 9 arrived at Mars on November 3, 1971 and was placed into orbit on November 24. This was the first US spacecraft to enter an orbit around a planet other than the Moon. At the time of its arrival a huge dust storm was in progress on the planet. Many of the scientific experiments were delayed until the storm had subsided. The first hi-resolution images of the moons Phobos and Deimos were taken. River and channel like features were discovered. Mariner 9 is still in Martian orbit.

**Mars 4** - USSR Mars Orbiter - 4,650 kg - (July 21, 1973)

- Mars 4 arrived at Mars on February, 1974, but failed to go into orbit due to a malfunction of its braking engine. It flew past the planet with in 2,200 kilometers of the surface. It returned some images and data.

**Mars 5** - USSR Mars Orbiter - 4,650 kg - (July 25, 1973)

- Mars 5 entered into orbit around Mars on February 12, 1974. It acquired imaging data for the Mars 6 and 7 missions.

**Mars 6** - USSR Mars Orbiter/Soft Lander - 4,650 kg - (August 5, 1973)

- On March 12, 1974, Mars 6 entered into orbit and launched its lander. The lander returned atmospheric descent data, but failed on its way down.

**Mars 7** - USSR Mars Orbiter/Soft Lander - 4,650 kg - (August 9, 1973)

- On March 6, 1974, Mars 7 failed to go into orbit about Mars and the lander missed the planet. Carrier and lander are now in a solar orbit.

**REPORT DOCUMENTATION PAGE**

*Form Approved*  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

<b>1. AGENCY USE ONLY</b> ( <i>Leave blank</i> )		<b>2. REPORT DATE</b>	<b>3. REPORT TYPE AND DATES COVERED</b>	
<b>4. TITLE AND SUBTITLE</b> A Chronology of Mars Exploration			<b>5. FUNDING NUMBERS</b> N.A.	
<b>6. AUTHOR(S)</b> Roger D. Launius				
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> N.A.			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>  N.A.	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> National Aeronautics and Space Administration Washington, DC 20546-0001			<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b>  N.A.	
<b>11. SUPPLEMENTARY NOTES</b> Chron dates: 1960 to2001. Future missions: 2003 to 2005				
<b>12a. DISTRIBUTION AVAILABILITY STATEMENT</b> Subject Category: Availability: NASA CASI (301)621-0390			<b>12b. DISTRIBUTION CODE</b>  N.A.	
<b>13. ABSTRACT</b> ( <i>Maximum 200 words</i> ) N.A.				
<b>14. SUBJECT TERMS</b> N.A.			<b>15. NUMBER OF PAGES</b> 5	
			<b>16. PRICE CODE</b> N.A.	
<b>17. SECURITY CLASSIFICATION OF REPORT</b> N.A.	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> N.A.	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> N.A.	<b>20. LIMITATION OF ABSTRACT</b> N.A.	