SAMPLE

Solar System Missions: Venera

Soviet Probes to Venus

Aira Astralis

Free sample: Introduction & Chapter 1

putrabooks.github.io

Buy the full book:

Carousell carousell.sg/p/solar-system-missions-venera-ebook-pdf-1467860545

ElevenReader

Payhip

Contents

Introduction

Chapter 1: The Discovery of Venera

Chapter 2: Understanding Venera

Chapter 3: Key Characteristics of Venera

Chapter 4: The Science Behind Venera

Chapter 5: Observation and Measurement of Venera

Chapter 6: Important Features of Venera

Chapter 7: Venera in Context

Chapter 8: Modern Understanding of Venera

Chapter 9: Challenges and Mysteries of Venera

Chapter 10: Future Directions in Venera Research

Chapter 11: Fun Facts and Trivia About Venera

Chapter 12: Conclusion: The Significance of Venera

Conclusion

This free sample contains the Introduction and Chapter 1. The complete book contains the full contents above.

Introduction

The Venera program (Russian: Вене́ра, pronounced [vʲɪ'nʲɛrə] 'Venus') was a series of space probes developed by the Soviet Union between 1961 and 1984 to gather information about the planet Venus. A total of eighteen probes were sent, including two related Vega probes. Thirteen probes successfully entered the Venusian atmosphere, including the two Venera- Halley probes. Ten of those successfully landed on the surface of the planet. Due to the extreme conditions, the probes could only survive for a short period on the surface, from 23 minutes to two hours. The Venera program established a number of precedents in space exploration, among them being the first man-made devices to enter the atmosphere of another planet (Venera 3 on 1 March 1966), the first to make a soft landing on another planet (Venera 7 on 15 December 1970), the first to return images from another planet's surface (Venera 9 on 8 June 1975), the first to record sounds on another planet (Venera 13 on 30 October 1981), and the first to perform high-resolution radar mapping scans (Venera 15 on 2 June 1983).

Chapter 1: The Discovery of Venera

Venera 9 (Russian: Венера-9, lit. 'Venus-9'), manufacturer's designation: 4V-1 No. 660, was a Soviet uncrewed space mission to Venus. It consisted of an orbiter and a lander. It was launched on June 8, 1975, at 02:38:00 UTC and had a mass of 4,936 kilograms (10,882 lb). The orbiter was the first spacecraft to orbit Venus, while the lander was the first to return images from the surface of another planet. The orbiter entered Venus orbit on October 20, 1975. A bell-shaped unit holding propulsion systems was attached to the bottom of the cylinder, and mounted on top was a 2.4- metre (7.9 ft) sphere which held the lander.

It carried instruments to take chemical and isotopic measurements, monitor the spectrum of scattered sunlight, and record electric discharges during its descent phase through the Venusian atmosphere. The spacecraft utilized a camera system, an x- ray fluorescence spectrometer, a screw drill and surface sampler, a dynamic penetrometer, and a seismometer to conduct investigations on the surface. A parachute deployed once the lander entered the Venusian atmosphere. The parachute detached at about 50 kilometres (31 mi) above the surface; simple air braking was used for the final descent.

The Venera 13 lander was equipped with cameras to photograph the surface and spring-loaded arms to measure the compressibility of regolith. The quartz camera windows were covered by lens caps that popped off after descent.

However, only one of these worked for Venera 13. The terrain at the touchdown point was bedrock outcrops breaking through dark, fine-grained regolith. After landing, the lander began to take a panoramic photograph while a mechanical drill deployed to collect a sample of the surface material. The samples were deposited in a hermetically sealed chamber, maintained at 30 °C (86 °F) and a pressure of about 0.05 atmosphere (5 kPa).

Sample composition was determined by the X-ray fluorescence spectrometer to be in the class of weakly- differentiated melanocratic alkaline gabbroids. Although the lander was designed to function for about 32 minutes, it continued to operate for at least 127 minutes in an environment where the temperature was 457 °C (855 °F) and the pressure was 9.0 MPa (89 standard atmospheres). The Venera lander appears in the book Contact (Sagan, 1985). On Ksanfomality's Venus Life Result Venera 2 (Russian: Венера-2 meaning Venus 2), also known as 3MV-4 No.4 was a Soviet spacecraft intended to explore Venus.

A 3MV-4 spacecraft launched as part of the Venera programme, it failed to return data after flying past Venus. An imaging system (cameras) Solar and

cosmic x-ray detectors Cosmic-ray gas- discharge counters Cosmic radio emission receivers The spacecraft made its closest approach to Venus at 02:52 UTC on 27 February 1966, at a distance of

That streak of early failures is easy to misread from the modern side of the table. The 3MV probes were pushing every technology of their era at once: launch vehicles barely adequate to the mass, deep-space navigation with no ground testing possible, computers that were barely more than sequencers, and thermal systems designed by analogy rather than experience. Every failed telemetry link and every dead battery produced a specific engineering response, and the program's internal culture treated each flight as a systems test as much as an attempt at science. Within five years of these losses the same industrial base was delivering spacecraft that could survive the full descent to the surface, and within fifteen it was returning panoramas.

The lesson the early Venera flights taught the rest of the field is that planetary programs are marathons run in laps, and the first laps are usually ugly. What distinguishes a program that eventually lands is not a clean record but the willingness to launch the correction. 23,810 km (14,790 mi). During the flyby, all of Venera 2's instruments were activated, requiring that radio contact with the spacecraft be suspended.

End of free sample. The full book is available at putrabooks.github.io

ABOUT THE AUTHOR

Aira Astralis is a science writer specializing in astronomy and space exploration. Her work spans the full breadth of humanity's relationship with the cosmos -- from the earliest naked-eye observations to the engineering marvels of modern space missions.

Her books are built on a foundation of primary sources: peer-reviewed research, mission archives, and direct engagement with the scientific community. She writes for readers who want to understand not just what we know about the universe, but how we came to know it.

She believes that the most important frontier is not out there but in the gap between what scientists discover and what the public understands. Her books exist to close that gap.