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DIRECTORATE OF
SCIENCE & TECHNOLOGY

Scientific and Technical Intelligence Report

Soviet Space Events During 1967

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VENUS 4

12 June 1967

DESIGNATION

Venus (Venera) 4, Sputnik 222, International 1967-058, SPADATS 2839.

LAUNCH SITE

Tyuratam

MISSION

The Soviets announced that the 2,438-pound spacecraft had scientific equipment on board to "carry out a wide program of scientific research in space during the flight"; and, "to gather information about the cloud-curtained planet's atmosphere and radiation."

RESULTS

The Venus 4 mission was an outstanding scientific success. Reliable communications were maintained during the 350-million kilometer voyage which ended on 18 October 1967. Data were gathered and relayed to earth throughout the long flight and valuable information on the atmosphere of Venus was obtained during the capsule's slow descent. Although the Soviets originally claimed that the capsule continued to operate until it reached the surface of the planet, there are excellent reasons to believe that this was not the case. The Soviets most likely anticipated far less pressure than actually exists on the surface and there are indications that the capsule failed structurally before reaching the surface. The reason for the original Soviet landing claim was probably due to a misinterpretation of the radar altimeter data.

ORBITAL ELEMENTS

	Parking Orbit RADINT
Apogee (nm)	268.14
Perigee (nm)	109.11
Inclination (deg)	52.02

LAUNCH VEHICLE

SL-6.

PAYLOAD

Overall 2,400 pounds, including capsule which weighed 844 pounds.

SOVIET PRESS COMMENTS

12 June—The Soviet Union today launched a space rocket with an automatic interplanetary station weighing 1.106 kilograms in the direction of Venus. The launching took place at 0450 Moscow time. The last stage of the rocket was at first brought to an orbit of an artificial earth satellite, and then was launched from that orbit and brought into space flight. The flight of the automatic station to Venus will last for more than four months.

The automatic station Venus 4 is moving along a trajectory close to the intended one. By 1400 Moscow time on 12 June 1967 the station was at a distance of 112,000 kilometers over a point on earth with the coordinates 70 degrees 18 minutes eastern longitude and 6 degrees 29 minutes southern latitude. All the equipment on board the automatic station Venus 4 is functioning normally.

The scientific equipment on board the automatic station Venus 4 will carry out a wide program of scientific research in space during the flight. Telemetric, measuring, and scientific apparatus will be switched on automatically in accordance with the program of the flight and also on commands by the radio from the ground.

12 June—The Soviet automatic station has started on its long and difficult trip to Venus, the closest but at the same time one of the most mysterious planets of the solar system. In past milleniums science has learned only a little about the perpetually cloud-covered globe. For instance, only recent radio location established that Venus makes a single revolution in 200 to 300 terrestrial days.

The current experiment is the fourth Soviet attempt to study the planet by means of rockets. Venus 4 differs from its predecessors by a somewhat greater weight. But its flight will continue for more than four months. Extensive scientific observations are to be conducted in outer space before it reaches its destination. The matter is that little is yet known about the physical conditions of flight in the expanses of the universe, and herein lies one of the difficulties encountered by scientists in designing spaceships.

Conditions in the surrounding area of Venus are also little known. Some inexplicable disruptions in radio communications during approaches to the planet were observed during previous experiments. As in previous flights, data on trajectory measurements will be accumulated within the next few months which are important for the study of the problems of super long-distance measurements. As to the penetration into the planet's secrets, it will take more than one launching for Venus to become familiar territory.

12 July—During its month-long flight the "Venera 4" automatic station has moved from the earth a distance of about 8 million kilometers. Twenty radio contacts have been effected during this period. A large amount of telemetric data on the physical processes taking place in outer space and on the functioning of the station's instrumentation and systems was received during these contacts.

According to telemetric data, all on-board equipment is working normally, and the pressure and temperature inside the station are within the prescribed limits. Guidance of the flight of the station and the operation of all of its on-board systems and instruments is accomplished by radio commands from the earth and autonomously by on-board programmed timing devices. "Venera 4," according to data from the special measurement complex, is moving along a trajectory close to that calculated.

15 July—At 1600 hours Moscow time on 14 July 1967, "Venera 4" was at a distance of 8 million 320 thousand kilometers from the earth and over a point on the earth's surface with the coordinates—12 degrees 14 minutes S latitude and 21 degrees 31 minutes E longitude.

Future radio contacts with the station will be made in accordance with the flight program. All information received from the station is being processed and reduced at the coordination-computation center.

18 October—The Soviet automatic station Venus 4, which for the first time softlanded on the surface of Venus today, has transmitted data on the planet's atmosphere.

Throughout the section of measurements of the temperature of the atmosphere, it ranged from 40 to 280 degrees centigrade and atmospheric pressure from one to approximately 15 atmospheres. The measurements have shown that the atmosphere almost exclusively consists of carbon dioxide. Hydrogen and vapors account for about 1.5 percent and no noticeable traces of nitrogen were detected.

The instruments of the landing apparatus conducted continuous stable measurements and transmission to the earth of the parameters of the atmosphere for an hour and a half on a stretch of 25 kilometers.

At 0734 hours Moscow time, the Venus 4 entered the atmosphere of Venus at the second cosmic speed and the scientific laboratory detached itself from the station and started its descent. After aerodynamic braking of the apparatus in the atmosphere, the automatic parachute system took over and its continued gradual descent in the atmosphere of Venus.

Venus 4 covered about 350 million kilometers before reaching the planet. In the course of its four-month flight the station sent back extensive information about the physical properties of outer space. On approaching Venus, the station recorded the absence of any noticeable magnetic field or radiation belts around the planet. A weak hydrogen corona was detected. The results of the station's scientific observations are being processed and will be made public.