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FOR RELEASE:
UPON RECEIPT

PROJECT: MARINER ENCOUNTERS VENUS

PRESS KIT

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MARINER ENCOUNTERS VENUS FEBRUARY 5

Mariner 10 will sweep by Venus on February 5, completing the first leg of history's first two-planet mission by a single spacecraft.

The 503-kg. (1108-lb.) Mariner will reach its closest approach to the cloud-shrouded planet at 1:01 p.m. EDT, at an altitude of approximately 5760 kilometers (3600 miles) from the surface.

As it curves around Venus, its two cameras will photograph the cloud formations (the first time for a spacecraft), and its instruments will probe the dense atmosphere.

January 24, 1974

- more -

Venus' gravity will bend the trajectory and decrease the speed of the spacecraft, allowing the gravitational pull of the Sun to bend the flight path inward for a later intercept of the orbit of Mercury, Mariner's primary target.

Mariner will fly by Mercury on March 29 at a distance of about 1000 km. (621 miles).

The "gravity-assist" technique involves no cost of energy for a flight mission, substituting for additional rocket power. Without it, either a larger, more expensive booster or a smaller payload would have been required.

The Mariner 10 experience with a gravity-assisted multiplanet mission, with its attendant precision navigation and trajectory correction techniques, will be a forerunner for future flights such as the 1977-81 Mariner Jupiter/Saturn mission.

Two corrections were required for the Venus portion of the flight to provide the accuracy necessary to utilize the gravitational attraction of Venus to reach the primary target, Mercury.

A mid-course maneuver on November 13 corrected for launch errors with a 19.90-second motor burn and a velocity change of 7.8 meters per second.

A second correction on January 21 applied a fine tuning to the trajectory with a short 3.7-second burn and a 1.7 meters-per-second velocity correction. This changed the expected arrival time, at periapsis (point of closest approach) by about two minutes and moved the flight path 1500 kilometers (945 miles) closer to the surface of Venus.

Two more corrections will be performed following Venus encounter for Mercury intercept.

At Venus, photography of the cloud deck will be at a resolution 200 times better than from Earth. Although the best photographs from Earth show only a featureless cloud layer, it is hoped that Mariner 10 pictures might reveal structure in the clouds, some stratification that will yield information on atmospheric processes.

Photography of the clouds at the boundary between the day and night side may yield shadow details not otherwise visible. Infrared red temperature measurements will be made of the cloud tops.

The cameras will also photograph the clouds through ultraviolet filters as a follow-on to ultraviolet observation from Earth that show blotchy patterns that apparently circle Venus once every four days. This phenomenon will be studied through several rotations and may add to our understanding of atmospheric and cloud processes.

In 1967, the Mariner 5 spacecraft observed an unexplained change in the structure of the Venus atmosphere between thirty and forty kilometers. Mariner 10 will perform a similar radio occultation experiment using a different pair of frequencies which should help to confirm the Mariner 5 results.

Sensitive measurements of the interaction of the Venus atmosphere with the solar wind will be made by the plasma science experiment and the magnetometer. Other experiments, the charged particle telescope and S-X-band radio science, can be collated with the plasma science results.

The extreme ultraviolet experiment will provide a new look at the Venus atmosphere at short ultraviolet wave lengths not possible from Earth observations as most ultraviolet radiation is caught or intercepted by Earth's possesive atmosphere.

During the cruise phase from Earth to Venus, Mariner 10 calibrated its camera systems by photographing the Earth and Moon. Despite the failure of camera heaters to turn on, the systems returned excellent high resolution pictures at extreme ranges approaching one million miles.

Later in the mission, the TV heaters came on when other heaters on the circuit no longer required, were turned off. This had been expected. Heating of the camera systems required new exposure settings based on prelaunch thermal testing.

The cloud cover of Earth was used to simulate Venus conditions photography, and the Moon's rugged surface and its reflectivity simulated Mercury. More than 1000 photographs were taken, including calibration pictures of stars in the Pleiades cluster.

Observations of Comet Kohoutek were made during this period by scanning with the ultraviolet spectrometer.

The latter effort revealed the Gum Nebula and the star Gamma Velorum radiating tremendous amounts of energy in the extreme ultraviolet wave lengths. In ultraviolet wavelengths the Gum Nebula appeared three times larger than previously known. Additional information will be sought during the mission.

As the spacecraft approaches Venus, it will perform a carefully prepared program of spacecraft operation designed to minimize problems that developed during the flight:

Prior to the second roll calibration maneuver, the spacecraft data handling logic circuitry was reset at gyro turn-on. This is an automatic function which should normally occur only at power turn on, or transfer to the redundant power processing system. Occurence at gyro turn-on could indicate a power problem.

On January 8, Mariner 10 did switch to the redundant power processing system in response to an unknown cause. Detailed telemetry studies have failed to reveal the source of a voltage or frequency change that would have triggered the switch to the back-up system.

This latter event was responsible for a careful power-use strategy being developed for spacecraft operation.

Another problem developed in moving the scan platform that points camera systems at the desired target. The platform does not respond fully when commanded to its highest pointing angle. As a result the platform will only be slewed over a range of 107°, losing the last 15°. This will have no effect on photography at Mercury, but has necessitated elimination of several high angle pictures at Venus.

On December 25, 1973, a problem developed with the S-band feed of the high gain antenna, used for transmitting spacecraft and science data to Earth. The problem, an intermittent one, will only affect real-time transmission of photography during a six-hour period at Mercury.

It was planned before launch that an extreme high bit-rate of 117,000 bits per second would be used at Mercury as at Venus if communication at that rate was acceptably error-free at the Mercury distance of nearly 100 million miles. This would have allowed transmitting a full-frame, high resolution picture to Earth every 42 seconds.

But the antenna problem, if still present at Mercury, will dictate the use of the standard mission rate of 22,050 bits per second. At this rate, the same number of pictures would be transmitted but in a quarter-frame high resolution format or in a full-framed low resolution format.

Pictures planned to be tape recorded on the spacecraft, to be played back later (full-frame, high-resolution), will not be affected.

(END OF GENERAL RELEASE; BACKGROUND INFORMATION FOLLOWS)

VENUS

Cloud-shrouded Venus has been a source of fascination to astronomers since Galileo first turned his newly-invented telescope on the planet in 1610.

Because Venus is similar to the Earth in size and mass, and was probably formed out of the same homogeneous mixture of gas and dust, it has often been called the Earth's sister planet.

But recent American and Soviet space probes have revealed atmospheric and surface conditions that differ markedly. The surface of Venus may be sizzling hot at 800°F., the atmosphere about 100 times heavier than that of Earth, and largely made up of carbon dioxide.

The processes that resulted in such unusual conditions are difficult to explain. Scientifically, Venus is the most puzzling planet in the solar system.

The existence of a Venusian atmosphere has been known since 1761, when a Russian astronomer observed a transit of Venus across the Sun. Continued observations over a number of years, however, failed to establish the composition of that atmosphere. The thick cloud cover of Venus effectively screened any attempts of measurements from Earth.

Because of the similarity of Earth and Venus in size and density, astronomers worked for a long time on the assumption that the planetary atmospheres would be the same. Many early observations were influenced by this bias, and Venus was depicted by some scientists as a water-soaked, tropical paradise.

The early work on Venus produced not only widely separated conclusions on its atmosphere, but also on its period of rotation. Estimates ranged from 1 day to more than 200 days.

Then, in mid 50's radio astronomy revealed extremely high surface temperatures in the 800 to 900° range. In 1962, Mariner 2 confirmed the observations. The earlier belief that Venus was covered with a dense tropical forest, and possibly harboring Earth-like forms, became untenable. Liquid water could not exist at those temperatures, and the complex molecules of life forms would break up.

Nevertheless, some attempts were made to reconcile the temperature measurements with a surface cool enough to support life. Some suggested that the measurements came from the atmosphere and not from the ground. Venusian surface temperatures remained in dispute until repeated radio telescope measurements and American and Russian spacecraft settled the point.

The atmospheric composition, however, and its temperature profile, remained unknown until recently. Pressure estimates ranged from a few times the atmospheric pressure of Earth to several hundred times.

Beginning in 1967, Mariner 5 and the Russian Venera spacecraft series began to bring into focus the present-day picture of the Venus atmosphere: nearly all carbon dioxide, pressure equal to 100 times that of Earth, and temperatures ranging from -40°F at the cloud tops (also measured by Mariner 2) to the range already known on the surface. The detection of water vapor beneath the layer of clouds also was reported by the Russian spacecraft.

Details of the structure of the Venus atmosphere are still an unknown today, despite careful studies and correlation of the large body of Earth-based observations and close-up spacecraft measurements.

The low temperatures of the upper atmosphere and the water vapor seen in the Venera measurements allow the possibility of water-ice clouds. However, the question of water vapor in the clouds is complex, and altitude and distribution factors are uncertain, as is the possibility of water mixed with other molecules or dust.

Current beliefs tend toward multi-layered clouds with various gases at different levels with a major constituent of water, either as ice crystals or in solution. A layer of haze may exist above the cloud tops which could explain the difficulty of measuring the makeup of the clouds from Earth.

The best of recent suggestions for cloud composition is a solution of sulfuric acid and water. The solution would be liquid at the temperatures and pressures of the Venus cloud deck, and exactly matches the index of refraction of the clouds as observed from Earth.

Prior observations of trace amounts of water above the clouds and large amounts beneath the clouds make sense in the presence of an effective drying agent like sulfuric acid.

Evidence of hydrochloric and hydrofluoric acid have also been seen in the upper atmosphere of Venus. A mixture of these gases and sulfuric acid, in a gaseous form, could create a highly corrosive mixture in the lower atmosphere.

Cloud studies from Earth have also revealed bands of clouds, seen in the ultraviolet, rotating around the planet in four days, a point to be studied by the Mariner 10 spacecraft.

What the surface is like on Venus is deduced from two sources. The landing of Venera spacecraft, which indicated a loosely packed material, and recent radar results showing large shallow craters and a generally smooth surface (with some rough areas approaching the complexity of the lunar surface). A dozen large craters were seen in the recent radar map produced by researchers at JPL. One crater was 150 miles across.

Radar measurements by JPL in 1962 determined that Venus has a retrograde rotation with a period of 243 Earth days. This is opposite to the other planets in the solar system and would have a direct influence on dynamics of the atmosphere.

NOTE: Spacecraft distances and velocities at hourly intervals will be available in the JPL News Center on February 2. Some of the following event times may change by several minutes.

SEQUENCE OF EVENTS

VENUS ENCOUNTER

Saturday, February 2

9:00 a.m. Open News Center at JPL

10:00 a.m. All science on except TV.
Time to encounter: 3 days.
Range to Venus: Range to Earth:
Goldstone DSS 14 (64-meter antenna) tracking till 2:30 p.m.
Canberra DSS 43 (64-meter antenna) tracking 2:30 p.m. - 12 mid.
Madrid DSS 63 (64-meter antenna) tracking 12 mid. - 7:30 a.m. 2/6

Sunday, February 3

Non-imaging science throughout.
Time to encounter: 2 days.
Range to Venus: Range to Earth:
(Tracking station coverage will be approximately the same through encounter).

Monday, February 4

Non-imaging science throughout.
Time to encounter: 1 day.
Range to Venus: Range to Earth:

Tuesday, February 5

9:21 a.m. Start Venus TV (dark limb). Picture every 42 seconds.

9:46 a.m. First TV picture showing lighted portion of planet (twilight cusp).

10:01 a.m. Closest approach to Venus: 3600 miles.
Range to Earth: 28 million miles.
Venus' disc is about 75% illuminated.

10:07 a.m. Enter occultation.
Slew high gain antenna in "tear trop" pattern to rack planet limb (radio science data). Record 36 TV frames and other science on tape recorder.
No "real-time" TV.

10:28 a.m.	Exit occultation. Resume high rate TV channel.
11:08 a.m.	Helium scan of planet by Ultraviolet Spectrometer (about 7 minutes).
11:20 a.m.	Start planet strip photography, 163 frames in six strips. Average resolution one kilometer.
12:00 Noon	Turn off Infrared Radiometer (IRR).
1:15 p.m.	Ultraviolet Spectrometer (UVS) airglow scan of Venus for hydrogen. About 12 minutes.
1:25 p.m.	Start TV mosaic, 238 frames (UV filters), average resolution: 3 kilometers.
2:30 p.m.	Transfer tracking from Goldstone to Canberra. End JPL receive pictures at 42-second intervals. Begins 3 3/4-minute intervals. (s/c to earth data rate remains at 117 kbps, but station to JPL relay at 22 kbps).
4:06 p.m.	2nd UVS airglow hydrogen experiment. About 6 minutes.
4:12 p.m.	Start TV mosaic, 180 frames (UV filters), average resolution: 4 1/2 kilometers.
6:20 p.m.	Start full planet TV mosaic (UVs and orange filters), 169 frames, average resolution: 5.7 kilometers.
8:16 p.m.	Start full planet TV mosaic (UV and UV polarizing filters), 169 frames, average resolution: 7 kilometers.
10:15 p.m.	Start full planet TV mosaic, 169 frames (UV and orange filters) average resolution: 8 kilometers.
12:00 Mid.	Transfer tracking station from Canberra to Madrid. *PICTURES OBTAINED TO THIS POINT: APPROX. 1200. Of the total, about 470 received at Goldstone and transmitted directly to JPL; 700 received at Canberra, 150 of which relayed to JPL via high-speed data lines; 36 frames stored on s/c tape recorder.

Wednesday, February 6

12:15 a.m.	Madrid tracking. Start TV mosaic, 64 frames (UV and UV polarizing filters) average resolution: 8.9 kilometers.
1:00 a.m.	TV mosaic, 64 frames, UV and Orange, 9.3 kilometers res.
1:45 a.m.	TV mosaic, 64 frames, UV and UV polarizing, 9.7 kilometers res.
2:30 a.m.	TV mosaic, 64 frames, UV and Blue filters, 10.2 kilometers res.
3:15 a.m.	TV mosaic, 64 frames, UV and Orange 10.7 kilometers res.
4:00 a.m.	TV mosaic, 64 frames, UV and Minus UV filters, 11.2 kilometers res.

4:40 a.m.	TV mosaic, 64 frames, UV and UV polarizing, 11.6 kilometers res.
5:25 a.m.	TV mosaic, 36 frames, UV and Blue, 12 kilometers res.
5:50 a.m.	TV mosaic, 36 frames, UV and Orange, 12.3 kilometers res.
6:15 a.m.	Conclude Venus Encounter TV. *PICTURES OBTAINED TO THIS POINT: APPROX. 1740. Of the total, about 710 relayed to JPL from all three tracking stations; about 1000 recorded on magnetic tape at Canberra and Madrid; and 36 recorded on board Mariner.
6:20 a.m.	Playback 36 TV frames and other science data recorded on spacecraft 20 hours earlier. Readout time: 2 hours, 17 minutes. (Spacecraft computer is updated during this period for execution of 16 days of far encounter TV).
7:45 a.m.	Transfer tracking Madrid to Goldstone.
8:40 a.m.	Real-time TV, one picture every 42 seconds, about 40 frames.
9:20 a.m.	Start 2nd playback of encounter tape from spacecraft. Readout time: 2 hours, 17 minutes.
9:50 a.m.	Charged Particle Telescope calibration 20 min.
10:01 a.m.	Venus encounter plus one day. Venus Range: *PICTURE COUNT: Approx. 1800, 800 of which received at JPL.
11:20 a.m.	First of 10 daily Ultraviolet Spectrometer far encounter scans. 20 minutes.
11:40 a.m.	Complete 2nd playback of Venus near encounter taped TV frames.
11:40 a.m.	Begin far encounter TV. Record 36 frames. Resolution approximately 16 kilometers.
12:10 a.m.	Playback 36 TV frames. Readout time: 2 hours, 17 minutes.
2:20 p.m.	Transfer tracking Goldstone to Canberra.
2:30 p.m.	Complete TV playback.
2:40 p.m.	Record 36 TV frames.
3:10 p.m.	Playback 36 TV frames.
5:40 p.m.	Record 36 TV frames.
6:10 p.m.	Playback 36 TV frames.
8:35-8:50 pm	Record 18 TV frames.
8:50-10:00 pm	Playback 18 TV frames.

10:05-10:20 pm Record TV frames.

10:20-11:40 pm Playback 18 TV frames.

11:30 pm Transfer tracking Canberra to Madrid.

11:40-11:55 pm Record 18 TV frames.

Thursday, February 7

Sixteen 18-frame TV mosaics at 1 1/2-hour intervals. Resolution decreases from 24 kilometers to about 40 kilometers. The 75-minute playback sequences begin at 10 minutes before midnight, 1:20 a.m., 2:50, 4:25 , 5:50, 7:20, 8:50, 10:25, 11:50 a.m., 1:25 p.m., 2:50, 4:20, 5:50, 7:20, 8:50 and 10:25 p.m.
Total frames: 288, one every 3 minutes, 44 seconds.

9:45-10:00 am 2nd UVS far encounter scan.

Friday, February 8

9:45-10:00 am 3rd UVS F/E scan.

Saturday, February 9

Four 18-frame TV mosaics. Average resolution: 58 kilometers. Playbacks begin at 10 minutes before midnight, 1:20 a.m., 2:50 a.m. and 4:20 a.m., concluding at 5:40 a.m. (This entire sequence may be preempted by engineering operations in preparation for third TCM.)

2:38 a.m. Tilt +x axis solar panel to 45°

3:38 a.m. Tilt -x axis solar panel to 45°

11:05 a.m. 3rd trajectory correction maneuver.

6:00 p.m. Post-maneuver update of s/c computer.

7:40 p.m. Start first segment of TV "Cyclic 3"--one recorded picture of Venus every hour until Feb. 22 (may require 4 frames each hour to assure full disc photo).

10:25 p.m. Play back 1st "Cyclic 3" tape (as many as 16 frames). Resolution: 71 kilometers

Sunday, February 10

2:25 a.m. Play back 2nd "Cyclic 3" tape. 16 frames.

4:25-4:55 pm Roll calibration maneuver (to calibrate s/c magnetometer).

7:20 p.m. Play back recorded TV. 16 frames.

11:20 p.m. Play back recorded TV. 16 frames.

February 11-22

Venus TV continues in the Cyclic 3 format--four frames every hour (to assure one picture of the planet every hour) until 11:20 a.m., Feb. 22. Sixteen frames will be played back every four hours. Final playback is completed at 12:40 p.m., Feb. 22. Each playback sequence is one hour, 20 minutes, and begins at the following times each day: 3:30 a.m., 7:30 a.m., 11:30 a.m., 3:30 p.m., 7:30 p.m. and 11:30 p.m. Resolution decreases to that of Earth-based resolution, about 250 kilometers.

ANTICIPATED VENUS TV TOTAL: 3712 Frames

MARINER 10 EXPERIMENTS

EXTREME ULTRAVIOLET

This experiment consists of two independent instruments, a fixed-pointing occultation spectrometer, mounted on the spacecraft body, and an airglow instrument, mounted on a scan platform. The experiment will perform analysis of planetary atmospheres.

At Mercury, the occultation spectrometer will search for an atmosphere above the edge (limb), of the planet's disc:

The airglow instrument will scan the entire disc to detect radiation from and measure altitude distribution of Hydrogen, Helium, Argon, Oxygen, Neon and Carbon components, if these gases are present.

During cruise the two instruments will measure distribution of Hydrogen Lyman-alpha emanating from the galactic and Magellanic cloud sources.

Close to Earth, the airglow instrument will observe the Hydrogen Corona of Earth, search for helium and measure the reflective properties of the moon at extreme ultraviolet wavelength.

At Venus the instruments will measure distribution of Carbon, Oxygen and Hydrogen Lyman-alpha and will search for Helium, Neon and Argon.

INFRARED RADIOMETER

This experiment will measure temperatures on the surface of Mercury and Venus by sampling thermal or infrared radiation.

The trajectory of the spacecraft past Mercury will provide measurements from late afternoon through the night side and into the early morning hours.

It is expected that temperature variations will be large. A thin or non-existent atmosphere will allow intensive heating of the day side. The slow 58.6 day rotation, without a heavy atmosphere to retain heat, will allow the night side to quickly radiate heat from the surface.

Absorption and loss rates can provide indirect evidence in the material of the surface, i.e. sand, gravel, rock. etc.

Unexpected variations, cooler or warmer, may be correlated with photographs of the area or measurements by other instruments. For example, mountains or valleys could give a temperature variation and might be visible in photographs or be reflected in atmospheric pressure measurements. Hot spots could also be correlated with volcanoes or a difference in surface materials.

At Venus, measurements of cloud top temperatures and at the edge of the planets disc will be made at higher resolution than by prior spacecraft.

RADIO SCIENCE

This experiment will provide data for celestial mechanics and occultation measurements from radio tracking of the spacecraft and analysis of planetary atmospheric effects on the radio signal.

The celestial mechanics experiment will determine the mass and gravitational characteristics of both Mercury and Venus from the effect of the planets on spacecraft trajectory and refine our knowledge of the orbits of the planets. The data will also yield estimates of the planets' internal composition and density.

In the occultation experiment radio waves from the spacecraft's transmitter will pass through the atmosphere of Venus or Mercury, enroute to Earth receivers, as Mariner passes behind the planets as seen from Earth.

Trajectories to both planets will provide Earth occultation.

Gases in an atmosphere diffract and diffuse the signal and analysis of the received signal yields pressure and temperature measurements from the top of the atmosphere down to the surface. These measurements can be fitted to a model of the gases present in the atmosphere. Analysis will also reveal if the planet has an ionosphere similar to Earth.

The cut-off of the signal as it grazes the surface provides a measurement of the radius of the planet.

As the thick atmosphere of Venus can bend the signal and trap it in a path around the planet, the antenna can be steered to offset the bending allowing deeper pentration of the atmosphere.

Data will be provided by the spacecraft's standard S-band transmitter and an experimental X-band system.

PLASMA SCIENCE

The Plasma Science Experiment will provide the first observations of the Solar Wind, a stream of energetic particles emanating from the sun, inside the orbit of Venus.

The experiment will be activated shortly after launch and will provide continuous measurements from the orbit of Earth to the orbit of Mercury, from 1 to 0.4 Astronaumical Units.

Objectives of the experiments are: To determine the mode of interaction between the planet Mercury and the solar wind, and to make a comprehensive study of the plasma regime at Mercury; to verify and extend previous observations of the solar wind interaction with Venus and to clarify the role of the electrons in the interactions; and to investigate the characteristics of the solar plasma between 1 and 0.4 AU.

Instrumentation for the experiment consists of two detectors on a motor-driven mounting (scan platform). The principal detector, facing sunward, is composed of a pair of electrostatic analyzers. The auxiliary detector is a single electrostatic analyzer facing away from the sun.

The forward-looking system is called the Scanning Electrostatic Analyzer (SEA) and the backward-looking system is the Scanning Electron Spectrometer (SES).

The SEA will measure positive ions and electrons, the SES will measure electrons.

TELEVISION EXPERIMENT

Two vidicon cameras equipped with eight filters each and capable of taking both narrow and wide angle phtographs are expected to return 8000 photographs that will include the Earth, Earth and Moon, Venus and Mercury.

They are mounted on a scan platform allowing movement in vertical and horizontal directions for precise targeting.

Catadioptric Cassegrain telescopes are attached to the vidicon cameras for narrow angle photography. An auxiliary optical system mounted on each camera provides wide angle photography. Changing to wide angle photography is permitted by moving a mirror on a filter wheel to a position in the optical path of the auxiliary system.

Exposure times range from 3 millisecons to 12 seconds. Each camera will take a picture every 42 seconds. Each television picture consists of 700 scan lines. There are 832 picture elements per line. Picture elements are digitally coded into 8 bit words for transmission.

The narrow angle system has a focal length of 1500 mm, and 1/2° field of view; the wide angle, 62 mm, 11X14° field of view.

There are seven filter positions. In order, they are: wide angle image relay mirror, blue band pass, ultraviolet polarizing, minus ultraviolet high pass, clear, ultraviolet band pass, defocussing lens (for calibration), and yellow band pass.

CHARGED PARTICLE EXPERIMENT

The instrument for this experiment has two parts, the Main Telescope and the Low Energy Telescope, mounted on the body of the spacecraft.

The experiment will measure charged particles near Mercury originating on the sun and in interplanetary space. Solar flares will be studied and correlated with measurements from Pioneers 9 and 10.

During cruise portions of the mission the experiment will measure solar and galactic cosmic rays. The separation of solar and galactic rays the effect of the sun on galactic rays is an important objective.

At Mercury, the possible existence of a magnetic field and bow shock wave will be sought.

The instrument can be commanded from Earth for calibration, disabling of failed detectors or to measure only certain high priority particles. The counting capability ranges from 0.01 to 100,000 particles per second.

MAGNETOMETER

This experiment will detect interactions of the solar wind with Venus and Mercury to yield a picture of the magnetic environment at each planet.

At Venus, evidence of a trailing magnetic field and a planetary field will be sought. Based on prior measurements, any planetary field will be weak.

As both Mercury and Venus rotate slowly, it is not expected that a iron core, if present, could create a dynamo effect as concluded for our own planet.

During the cruise portion of the mission, the experiment will measure interplanetary fields. Measurements between the orbits of Venus and Mercury will be conducted for the first time.

The experiment employs two fluxgate magnetometer sensors both mounted on a six-foot boom. One is mounted close to the spacecraft to measure magnetic disturbance from the spacecraft. This data will be used to interpret measurements by the other sensor which is located outboard on the boom to minimize magnetic effects of the spacecraft.

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