

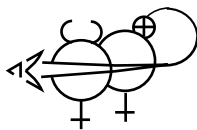
MARINER VENUS / MERCURY 1973

STATUS BULLETIN

Mariner 10 on Target, Taking Pictures



Left, the Earth as seen by Mariner 10's TV cameras last Saturday, from a distance of about 200,000 km (120,000 miles). Dark area (center) is the south part of the Gulf of Mexico at dusk. The sunlit, cloud-covered Pacific is on the horizon. The United States are under the clouds, upper left. Right, a partial mosaic of the Moon, from a distance of 110,000 km (68,000 miles). The dark areas are Maria: Serenitatis and Tranquillitatis, landing sites of Apollo 11 and 17, lower left, while the circular area at right is Mare Crisium.



Mariner 10 continues on its way toward Venus and Mercury, its scientific mission partly endangered but by no means undone by temperature problems. Television instrument temperatures appear to be stabilizing at difficult but livable values, provided the vidicon tubes are kept turned on during the cruise between planets. The vidicons are at about -10°C ($+14^{\circ}\text{F}$), the backs of the optics about -20°C (-4°F), telescope fronts about -30°C (-22°F). Defocusing, considered earlier to be a possible consequence of the reduced temperatures, appears not to be a problem at this time. The telescopes are cold because the electrical heaters in the instruments are not working; tests and analysis of this problem are underway.

A serious problem, in the plasma science experiment, emerged Monday afternoon when the instrument was first turned on and solar-wind particles were not observed. One possibility is that the instrument door is partly closed, blocking the plasma. Another is a problem in the particle-energy sweep. This could be stuck at the high end, permitting only a few high-energy particles, not really relevant to this experiment, to register. This may be a temperature problem: the instrument is running a little cold. Since it is out in the sun, it will get warmer as the mission proceeds. There appears to be a good vacuum in the detectors, and the device is scanning back and forth as intended. A number of tests and switching commands are being performed.

All other spacecraft subsystems are performing exactly as expected. The trajectory is very good. Less than 8 meters/sec of the spacecraft's maneuver capacity (of 120 meters/sec) should be required to move the Venus aim point and change the arrival time by about 3 hr (next Feb. 5) to bring Mariner 10 to its pass 1000 km above the surface of Mercury next March 29. About 700 TV frames have been obtained so far, together with UV scans, magnetometer data, and charged-particle measurements. As of 8:00 AM, November 7, the spacecraft has travelled 7,587,000 miles, and is just over a million miles from Earth.