

MISSION STATUS BULLETIN

VOYAGER

March 1, 1978



No. 16

SUMMARY

A temporary suspension of all but essential spacecraft activity has been directed so that full attention can be concentrated on understanding several new spacecraft problems and on maintaining schedules in preparation for Jupiter encounter.

Several problems aboard Voyager 1 are under investigation, including the cruise science maneuver abort on February 17, a degradation in sensitivity of the plasma instrument, and a problem in maneuvering the scan platform. Tiger teams are currently analyzing the problems to understand them and their effects.

Voyager 1 is about 349 million kilometers (217 million miles) from Earth, nearly six months into its journey with almost 10 months to go before the start of Jupiter observations. One-way communication time is 19 minutes 18 seconds.

One-way communication time with Voyager 2 is 18 minutes 42 seconds, at a distance of nearly 339 million kilometers (210 million miles) from Earth. Voyager 2's observations of Jupiter will begin in about 13 months.

UPDATE

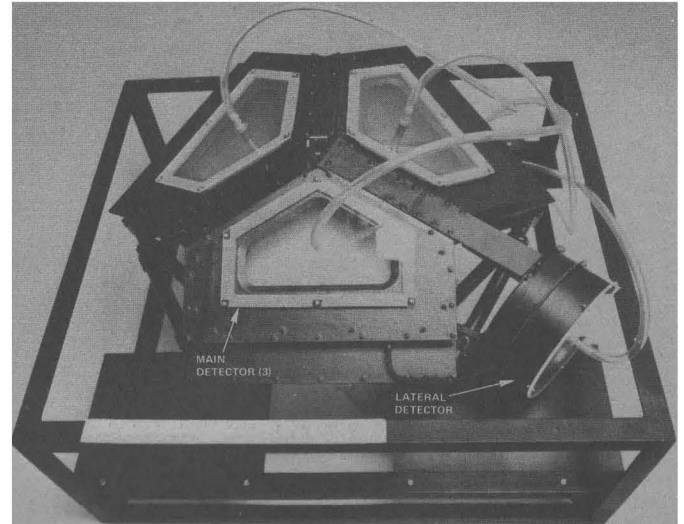
VOYAGER 1

Cruise Science Maneuver

A routine cruise maneuver to calibrate several science instruments by turning the spacecraft to scan the entire sky was automatically terminated before completion on February 17 when the command control subsystem (CCS) computer entered a failure protection mode.

The cruise maneuver consists of ten complete 360° yaw turns, followed by sun acquisition, and then 24 complete 360° roll turns. Apparently, the sun sensors did not find the sun as planned after the ten yaw turns, and a pitch and yaw maneuver, as part of the sun loss routine, was required to regain solar reference.

The spacecraft normally uses the sun and the star Canopus as references to maintain a steady position rather than tumble about in space, except when on-board gyros are commanded to be used as the reference. During the yaw turns, gyro references were in use, and some form of gyro-induced



PLASMA INSTRUMENT. The protective covers on the three apertures of the ailing main detector were removed before launch, along with the piping which filtered clean cool air into the instrument before launch. The unaffected side-mounted detector is in the foreground in this photograph.

error is suspected as the cause of the problem, since sun sensor data indicates a difference between expected and actual sun position after each complete yaw turn.

The data from the maneuver is being analyzed in detail to fully understand the problem and to determine its affect on future operations.

Plasma Instrument

Although apparently unrelated to the events causing the cruise maneuver abort, a problem in Voyager 1's plasma instrument was also detected February 17. The sensitivity of the main cluster of three detectors appears to have dropped significantly. Initial indications are that the science objectives can still be met at Jupiter; however, during cruise, measurements of positive ions at the lower energy levels in interplanetary space will be significantly affected. The instrument is designed to measure ions in the energy range from 10 to 5950 electron volts. The side-mounted detector, positioned at right angles to the ailing main cluster (which points toward Earth), is unaffected and working as planned.

NASA

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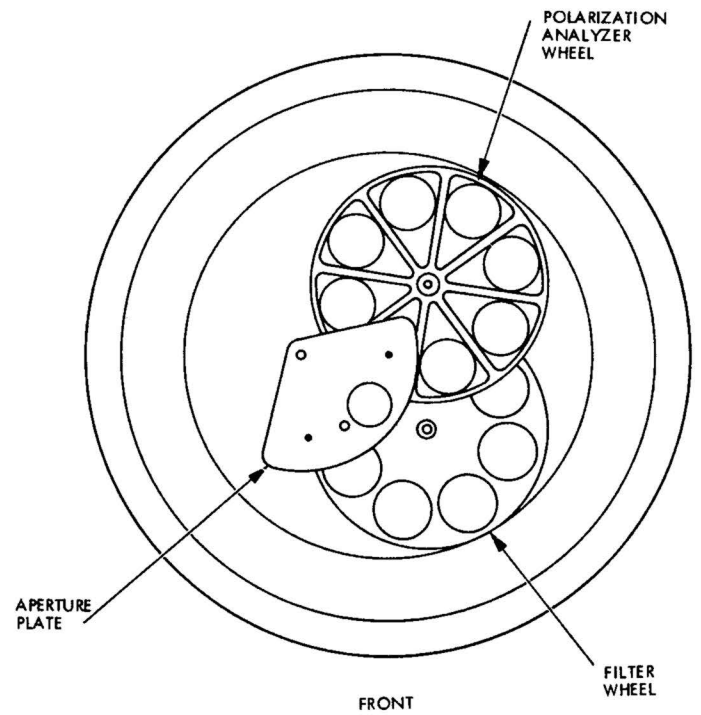
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Scan Platform

During a calibration of the scan platform on February 23, the platform's azimuth movement appears to have gradually slowed and did not reach the desired position in the hour allowed. When the hour was clocked by the attitude and articulation control subsystem (AACS) computer, the calibration was terminated. Analysis is underway to determine the cause and what remedies can be taken.

VOYAGER 2

Voyager 2 presented a not altogether unpleasant surprise when it was detected that the stuck analyzer wheel of the photopolarimeter instrument appears to have become unstuck and operable. The wheel, stuck since shortly after launch, appears to be stepping properly, but further study is needed before concluding that the instrument is operating normally again. At nearly the same time, the filter wheel began to display erratic behavior, and the instrument has now been turned off until these latest developments can be understood. The normal operating mode of the instrument is to step through 40 filter/analyzer wheel combinations once every 24 seconds to provide intensity and polarization measurements of scattered sunlight at selected wavelengths.



PHOTOPOLARIMETER (PPS). In the normal operating mode, the instrument steps through 40 filter/analyzer wheel combinations every 24 seconds.

