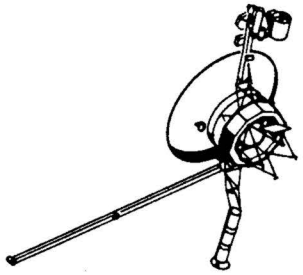
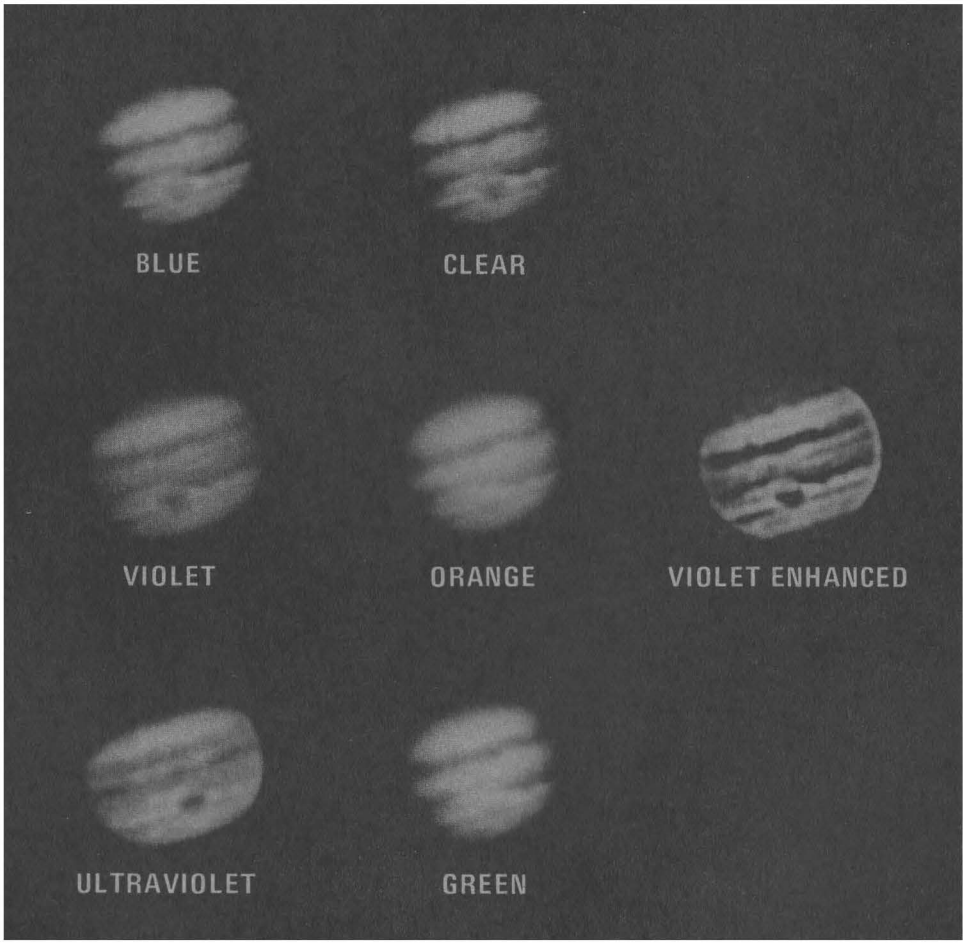


MISSION STATUS BULLETIN

VOYAGER

June 27, 1978 **No. 21**



VOYAGER 1 took these narrow-angle pictures of Jupiter on May 19 from a distance of 295 million kilometers (183 million miles or about 2 AU). The original image scale is 2900 kilometers/pixel, still poorer than the best Earth-based photography. Of the original sixteen narrow-angle images, taken during a twenty-five minute interval, the Image Processing Laboratory (IPL) at JPL has chosen six, one in each color, to present in this illustration. The six have been digitally enlarged and increased in contrast by the IPL. The seventh frame is a version of the violet image, which has been spatially filtered to specially enhance the smallest details. Notice that Jupiter's Great Red Spot is prominent in pictures taken at short wavelengths (ultraviolet, violet, and blue) but is not clearly visible in longer wavelength (green and orange) images. Almost ten months of Earth-to-Jupiter cruise remained on May 19.

NASA
National Aeronautics and Space Administration

Recorded Mission Status (213) 354-7237
Recorded Mission Operations Status (213) 354-6665
Status Bulletin Editor (213) 354-4438

jpl
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California 91103
AC 213 354 4321

SUMMARY

Voyager 1 is about 679 million kilometers (422 million miles or about 4-1/2 AU) distant from Earth, travelling with a heliocentric velocity of 18 kilometers (11 miles) per second. One-way communication time is 37 minutes 42 seconds.

Travelling with a heliocentric velocity of 17 kilometers (10.5 miles) per second, Voyager 2 is 651 million kilometers (405 million miles or about 4-1/3 AU) from Earth. One-way light time has stretched to 36 minutes 10 seconds.

UPDATE

VOYAGER 1

Scan Platform

Constraints on Voyager 1's scan platform slewing envelope have been removed following successful in-flight testing.

Tests on three consecutive days (May 31 through June 2) moved the platform through the area in which the platform hung up in February, with no hangup in the area of concern, below 60° azimuth.

Previous tests in March and April, which avoided the problem area, indicated no problems in moving the platform through other regions.

In the latest test, azimuth axis motion was evaluated over the range of 345° to 10°, and particularly from 53° to 31°. No irregularities were found other than possible slowdown at higher azimuth angles, which is still being analyzed.

Plasma Instrument

Voyager 1's plasma instrument is operating normally again following a series of tests in mid-May.

The sensitivity of the main detector dropped significantly on February 17. Analysis of the problem indicated an open circuit in an amplifier, and a series of heating and cooling tests was planned in an effort to restore contact.

On May 16, the replacement heater was turned on, raising the temperature of both the modulator and the electronics, but no change in science data was observed at that time and the heater was turned off.

However, minutes prior to the start of the cooling test on May 18, which would have turned off all heaters, data indicated that the instrument was operating properly, and the cooling test was cancelled pending further analysis.

The instrument has been returning good science data since that time.

Pitch Thruster Test

A test of the pitch thruster impingement was conducted on Voyager 1 on June 15.

The test provided data to refine comparisons of calculated versus observed impingement values. Voyager 1's first trajectory correction maneuver last fall indicated that a portion of the exhaust gas from the thrusters is impeded by a bus support structure. This reduces the desired velocity changes.

In this test, the spacecraft's high gain antenna was turned 45° off Earth point in either direction to fire first one and then the other pitch thruster while pointing at the Earth. The thrusters are mounted at a 45° angle on either side of the high gain antenna.

All signals but the wide carrier signal were turned off and Earth receivers were focussed in on the high gain antenna to track the resulting doppler effect. In a few months, the spacecraft-to-Earth distance will be too great to capture the signal with the high-gain antenna pointed that far off the Earth line.

Analysis of the test results is continuing and will be factored into calculations for future maneuvers.

VOYAGER 2

Backup Mission Load

A backup mission sequence was relayed to Voyager 2 on June 23. This computer program is designed to ensure at least a minimum mission return should communications be lost through failure of the remaining receiver sometime in the future.

Voyager 2's primary receiver failed on April 5, leaving the spacecraft with only one receiver and no recourse should that one fail. Early probe missions were equipped with only one receiver and carried backup sequences as safeguards.

The sequence will be stored in the backup computer command subsystem. It includes operation of all 11 experiments, including imaging at Saturn but not at Jupiter. The scan platform would move through three positions per planet, as compared to the thousands of positions it would assume in the normal mission.

The load also includes one trajectory correction to retarget to Saturn after Jupiter encounter in July 1979.