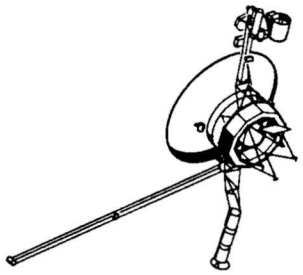


MISSION STATUS BULLETIN

VOYAGER

August 25, 1977 **No. 4**

CURRENT STATUS

Voyager 2

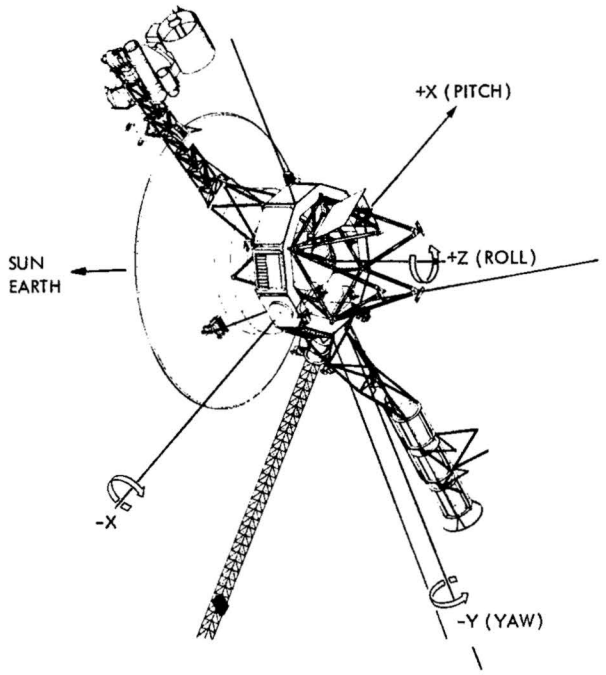
Voyager 2 is now in celestial cruise, after acquiring the star Canopus on August 24. The spacecraft is now stabilized on three axes in celestial lock.

The attitude and articulation control subsystem (AACS) acquires Canopus through a series of roll turns during which the Canopus star tracker assembly of the AACS scans the sky for a light source of the intensity of Canopus and at the proper cone angle. The star is then maintained in the sensor's field of view by actuation of the thrusters.

A specially designed exercise will be conducted early on August 26 to accurately determine the position of the science boom, and to make a concentrated attempt to lock the boom in place, if it is not already there. The attempt-to-lock sequence will involve simultaneously jettisoning the infrared interferometer spectrometer (IRIS) dust cover and rotating the spacecraft in a manner which will put as much torque as possible on the boom in a direction to latch it. The boom angle measurement will involve taking a series of wide-angle TV images of star fields at selected scan platform and spacecraft roll positions.

The first of eight trajectory correction maneuvers (TCMs) planned for the mission will be commanded on August 28. The first maneuver will be commanded in two parts, one part August 28, and the second about 54 days into the flight, during the first week of October. Three more maneuvers will be executed prior to Jupiter encounter and four more between Jupiter and Saturn. Exercise of the Uranus option after Saturn will require another trajectory correction maneuver.

At 11:25 p.m., PDT, August 24, the spacecraft experienced another attitude disturbance similar to the one noted on August 21 at 2:42 a.m., PDT, about 18 hours after liftoff. Flight controllers are analyzing data tapes of the disturbances and have ruled out the possibility that the expended propulsion module may have bumped the spacecraft or that it may still be in the vicinity of the spacecraft.



PITCH, ROLL, AND YAW AXES

VGR77-2 (Voyager 1)

Inspection of the VGR77-2 spacecraft continues at the Spacecraft Assembly and Encapsulation Facility No. 1 (SAEF 1) at Kennedy Space Center. Proper operation of the microswitch on the science boom of this spacecraft has been validated through the Flight Data Subsystem.

Re-encapsulation in the Centaur standard shroud is planned for August 26 with mating to the Titan III E/Centaur launch vehicle at launch complex 41 and power turn-on scheduled for August 28, in preparation for liftoff on September 3.

TC-6 Launch Vehicle

The TC-6 Titan III E/Centaur launch vehicle was moved to launch complex 41 on August 21 and is undergoing preparation for mating with VGR77-2. Launch complex 41 suffered only minimal damage during the launch of Voyager 2 on August 20.

NASA
National Aeronautics and Space Administration

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

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LAUNCH VEHICLE DESCRIPTION

The Titan/Centaur launch vehicles boosting the Voyager spacecraft toward the outer planets consist of a Titan III E booster, a Centaur upper stage, and a Centaur standard shroud. Voyager 2 rode TC-7, while Voyager 1 will ride TC-6.

The Titan III E booster vehicle consists of two five-segment solid rockets (Stage 0) manufactured by the Chemical Systems Division of United Technologies and the Titan Stage I and II liquid propellant core sections built by Martin Marietta.

The solid rocket propellant is a baked mixture of an oxidizer, ammonium perchlorate, and a fuel, powdered aluminum. The segments initially develop a combined thrust of about 5.34 million Newtons (1.2 million pounds).

The liquid propellant of Stages I and II is Aerozine-50, a 50-50 mix of hydrazine and unsymmetrical dimethylhydrazine (UDMH) oxidized by nitrogen tetroxide. Stage I develops a thrust of 2 million Newtons (470,000 pounds) while Stage II's thrust is 445,000 Newtons (100,000 pounds).

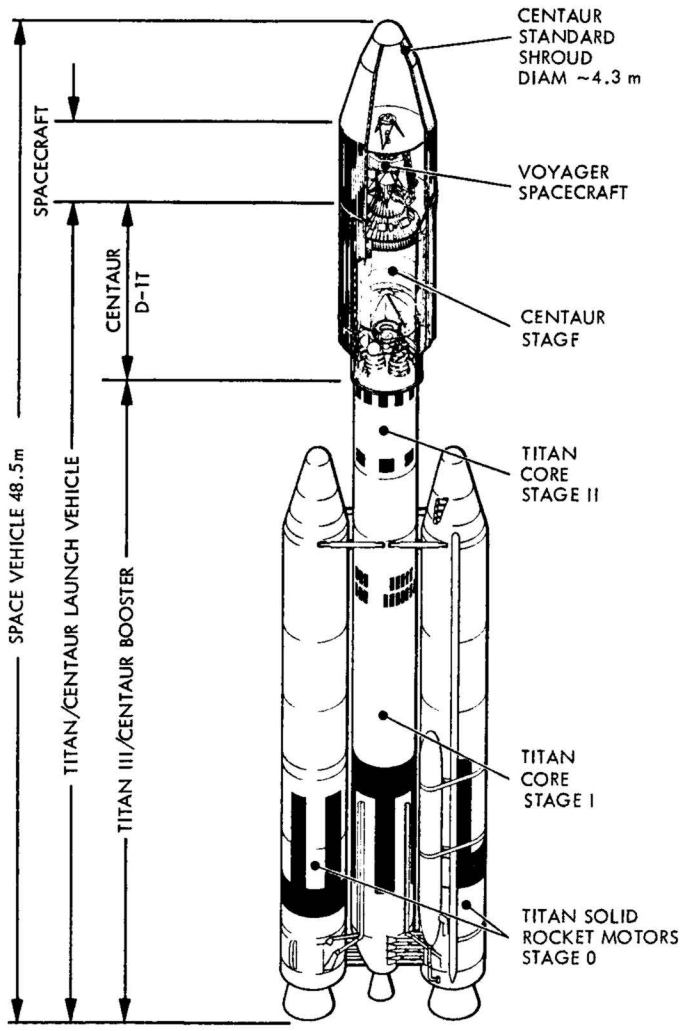
The Centaur prime contractor is General Dynamics/ Convair. The Centaur D-1TR system provides guidance for the entire vehicle, except that the Titan has its own stabilization system. Liquid hydrogen and liquid oxygen propellants are pumped to the two main engines, where a combined thrust of 133,440 Newtons (30,000 pounds) is developed.

The solid rocket motors are seven stories high, while the Titan Stage I and II combination which sits between them rises eight stories. The Centaur stage adds another three stories. With the encapsulated spacecraft (mission module and propulsion module) mated to the Centaur, the entire space vehicle stands 13 stories or 48.5 meters (159 feet).

The launch profiles for each Voyager require six separate engine burns, five by the launch vehicle and one by the Voyager propulsion module. Each stage is discarded after completing its burn. The Centaur's first burn injects the Centaur and its payload into a low altitude parking orbit of the earth, and about 51 minutes later the Centaur separates from the Voyager after a second burn. The final boost to Jupiter is provided by the propulsion module.

The propulsion module provides the final boost needed for spacecraft injection into a Jupiter trajectory. The solid rocket motor in the propulsion module ignites about 15 seconds after the spacecraft separates from the Centaur stage. It burns for approximately 45 seconds and is jettisoned about 11 minutes later. Four pyrotechnic squibs explode to release the propulsion module from the mission module. The distance between the propulsion and mission modules nominally increases at a rate of about 0.61 meter (2 feet) per second due to the spring separation impulse.

The propulsion module is basically an aluminum cylinder, 99 cm (39 inches) in diameter and 89 cm (35 inches) long, suspended below the mission module by a tubular truss adapter. The rocket carries 1,039 kg (2,290 pounds) of hydrazine propellant, developing an average 68,085 Newtons (15,300 pounds) thrust and adding a velocity increment of about two kilometers per second (4,475 miles per hour).



TITAN III E/CENTAUR/VOYAGER SPACE VEHICLE