SPACE

Asteroid Belt Probe

The composition and appearance of asteroids would be of concern in a space probe which might make travel to the distant planets less hazardous—By Jonathan Eberhart

➤ A SPACE PROBE fired through the crowded asteroid belt beyond the orbit of Mars has been suggested as a safety measure to precede any flights to the outer planets.

The asteroid belt consists of thousands of pieces of debris, ranging from dust particles to Ceres, which is 460 miles in diameter. Asteroids are roughly divided into three major belts, all between the orbits of Mars and Jupiter.

An unmanned vehicle that would collect data on the asteroids and that might even continue on to observe Jupiter was described by David J. Shapland of Lockheed Missiles and Space Company, Sunnyvale, Calif.

The most important information the probe could obtain would be the distribution of asteroids within the belts. This would be the same as measuring a spaceship's chances of getting through the belts unscathed.

Asteroids are more than just outer space roadblocks, however. Scientists are interested in what they are made of and what they look like. The probe would, therefore be equipped to capture and analyze small asteroids, while a TV camera might reveal some of the surface features of the larger chunks. A total of 25 instruments, including three kinds of television, are included in the probe's design, which was discussed at a conference on unmanned exploration of the solar system in Denver. The trip would take at least two years, making reliability especially important, said Mr. Shapland. Heavier walls and structures of the probe would be necessary for such a long mission, he said, because of the increased danger from micrometeroids.

An Atlas Centaur rocket equipped with an additional high-energy third stage is the most likely launch vehicle.

Launching dates are not critical for the asteroid belts since the belts form full circles around the sun. The problem of finding a planet at the proper position does not exist. However, if a Jupiter fly-by were added, launch years in the next decade would be limited to 1970, 1971 and 1975.

• Science News Letter, 87:115 February 20, 1965

SPACE

Satellite Balloon-Watch

➤ HUNDREDS of balloons will be watched over by a French satellite as they bob and glide through the atmosphere some time in 1967.

Each balloon will be equipped with its own tiny radio transmitter, no two of which will send the same signal. This will enable the satellite to tell the balloons apart and to follow the motion of each one.

The purpose of this Project EOLE is to measure air currents, pressures and temperatures above the Southern Hemisphere.

As many as 1,000 balloons will be launched during a period of a few weeks over a "large oceanic area in the Southern Hemisphere" selected to minimize interference with air traffic. The spheres will float at an altitude of about 30,000 feet.

The satellite will record the position of each balloon at regular time intervals and later play back the data to a ground station.

The project was outlined by Dr. Raymond Hamelin, scientific attache of the French Embassy, at a symposium in Denver on unmanned exploration of the solar system.

Late this year or early in 1966 a French Diamant rocket will launch a cylindrical solar-powered satellite, the D-1, from the Hammaguir launch site in Algeria.

Three transmitters aboard the D-1 will monitor the launch, which is primarily a test program for the launch rocket, the tracing network and the telemetry equipment. Before the all-French D-1, however, a cooperative U.S.-French probe will be fired from Vandenberg Air Force Base, Calif.

This probe will study irregularities in the ionosphere by monitoring very low frequency (VLF) radio waves sent from transmitters on the ground.

One station in France and one in Panama will be the VLF sources as the satellite follows its circular orbit about 500 miles above the earth.

A second "D" satellite is planned for the second half of 1966. The D-2 will study the earth's corona, a layer of ionized hydrogen called "earthlight."

• Science News Letter, 87:115 February 20, 1965

SPACE

Second Sun-Watching Satellite Now in Orbit

➤ THE SECOND SUN-WATCHING satellite in the United States' orbiting observatory series, OSO-B2, is now in orbit after two attempts.

Originally scheduled for launching last April 14, the satellite was seriously damaged when the third stage rocket to which it was attached exploded during a test, fatally burning three technicians and hospitalizing nine more. Six of the eight experiments aboard were salvaged and, together with parts of an earlier prototype satellite, a virtually new spacecraft was built. It was launched again Feb. 3.

The heart of OSO is an instrument called a scanning spectrometer, which is looking across the face of the sun, "seeing" light of different wavelengths. Scientists on earth can stop the scanning at any wavelength in the ultraviolet, and then command OSO to take a picture at that wavelength.

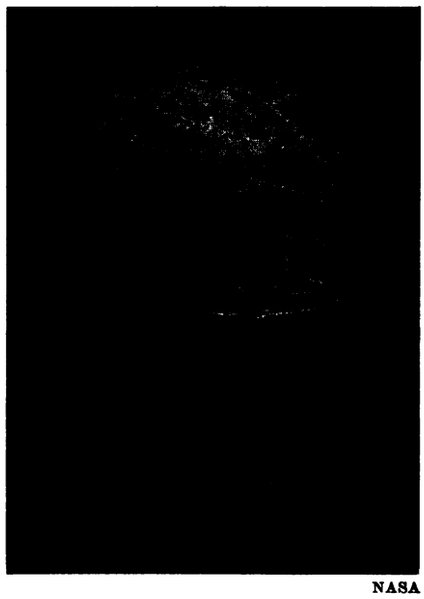
Other experiments include measurement of X-rays coming from the sun, observation of the solar corona in white light, and monitoring of polarized red and blue zodiacal light. Additional spectrometers measure high and low energy gamma rays coming from the sun. Finally, a survey is being made of ultraviolet light sources throughout the sky in wavelengths between 1300 and 2600 Angstroms.

OSO-B's predecessor, called OSO-1, was launched on March 7, 1962, and worked perfectly until May 22 of that year, when it lost its power, then mysteriously regained it 33 days later.

Although it was originally expected to work for no more than six months—by which time the satellite's gas-operated attitude control jets would have run out of fuel—OSO-1 hung on, transmitting data until March 11, 1964, less than six weeks before the tragic explosion involving OSO-B.

Two changes in OSO-B from the earlier model are the use of a new scanning system, enabling the instruments to cover the entire solar surface in four minutes, and a new telemetry system that has increased the satellite's ability both to transmit data and to receive instructions from earth.

• Science News Letter, 87:115 February 20, 1965



NASA

SPIDER-LIKE SUN WATCHER—This is OSO-B2, now in orbit around the sun, as it was checked at Cape Kennedy prior to being launched by the National Aeronautics and Space Administration. Because part of its predecessor exploded, it is the first successful launch in the series.