SPACE

Explore Pathway to Moon

More information on what an astronaut may encounter in space on a voyage to the moon is being sought by two unusual space vehicles recently launched.

➤ TWO EXTRAORDINARY SPACE vehicles are now probing the vast space that lies between the earth and the moon.

The multiple-shot project, a continuation of the late President Kennedy's Apollo men-to-the-moon project, is providing valuable information on cosmic rays, particles streaming from the sun, and other phenomena that astronauts may face on their way to the moon.

The satellite IMP (Interplanetary Monitoring Platform), launched Nov. 26 from Cape Kennedy, is designed to swing farther away from the earth—173,000 miles—than any previous satellite launched by the National Aeronautics and Space Administration.

The five-ton rocket stage Centaur, launched at 2:03 p.m., Nov. 27, from the same space center, is the first space machine to use super-cooled liquid hydrogen as fuel.

Standing 28 feet high, the Centaur is "empty," according to space lingo. This means it is not carrying any payload or satellite. The burned out rocket stage itself is the satellite, carrying several sets of instruments to gather flight data such as stress and temperatures.

NASA scientists hope the high-energy characteristics of liquid hydrogen will permit future Centaur rockets to send complex missions deeper into space than ever before attempted.

Hydrogen offers more pounds of thrust per pound of propellant consumed than any other fuel now used in chemical rockets—about 35% more energy for launching vehicles than conventional kerosene-type fuels.

The hydrogen-propelled vehicle was pushed into space by a 72-foot Atlas which separated from the Centaur after it had burned itself out. Two engines on the Centaur then ignited to propel the vehicle into an orbit around the earth stretching as far as 1,035 miles into space and coming as close to earth as 345 miles.

The Centaur can stay in orbit for approximately 200 years.

The 138-pound IMP was launched from a three-stage Delta Rocket. It carries delicate equipment designed to measure magnetic fields, cosmic rays, and solar winds in the space between the earth and the moon.

At apogee—the farthest point in orbit away from earth—it will be flying almost three-quarters of the distance to the moon. Then it will swing back around the earth in a cigar-shaped orbit with its perigee—the point nearest to earth—about 125 miles. Each orbit takes 153 hours, or a little more than six days.

The IMP, first of a series of seven such satellites, will spend more than two-thirds of each orbit in regions which are beyond the influence of the earth's magnetic field.

This far-flung satellite, formally called "Explorer 18," is designed to relay information to earth about the charged particle radiation streaming from the sun and from some mysterious source outside the solar system.

It also sends data about the magnetosphere—an envelope formed by the earth's magnetic field which protects man from certain types of dangerous radiation.

• Science News Letter, 84:371 Dec. 14, 1963

COMMUNICATIONS

World Communication Promised By Syncoms

➤ SCIENTISTS are moving closer to the day when three space satellites will girdle the earth's equator in an all-encompassing network of world communications.

These satellites, each one placed at fixed intervals above the equator, will fly at speeds synchronized with that of the spinning earth beneath. Each thus will remain "fixed" over a point on earth.

This is the ultimate goal of the Syncom satellites now being tested in orbit, explained the National Aeronautics and Space Administration, which is planning to launch space satellite Syncom III sometime between April and June, 1964.

The 63-pound Syncom III is scheduled to hover in "fixed" position above the international date line in the Pacific, about halfway between the United States and Asia.

With ground stations as yet undetermined in Asia, and a ship station near Guam, this satellite will receive, store and transmit communications signals between the U.S. and Asia.

• Science News Letter, 84:371 Dec. 14, 1963

SPACE TECHNOLOGY

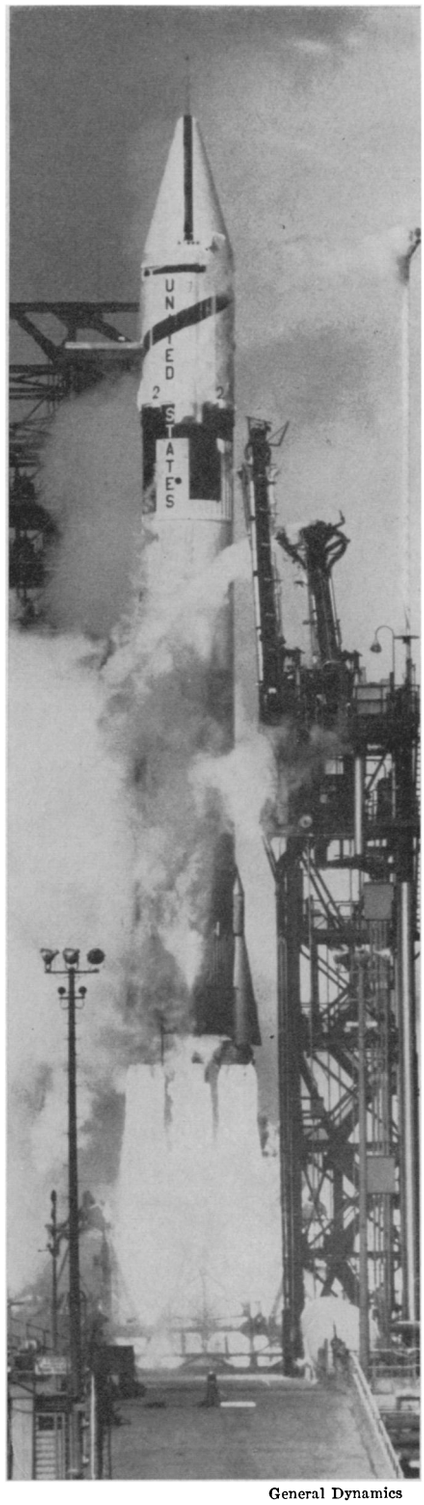
Solar Cells Provide Electricity for Rockets

➤ AN ELECTRICAL POWER system for space rockets has been devised by an engineer at the National Aeronautics and Space Administration's Marshall Space Flight Center in Huntsville, Ala.

The main element of the system is solar cells on the rocket's exterior that gather energy from the sun and store it in capacitors. The stored energy can be used to operate tools and equipment on board.

It can also be used to power high-energy devices requiring large amounts of power for a very short time, as short as a few hundred microseconds, such as lasers and magnetic pulse equipment.

• Science News Letter, 84:371 Dec. 14, 1963



General Dynamics

200-YEAR-TRIP—Centaur is shown shortly after launch from Cape Kennedy as it was boosted into space by Atlas. The two vehicles, joined together at launch, separated at the edge of the atmosphere, where Centaur's own engines started up for the flight in space. On this flight the Centaur achieved an earth-orbit which can endure for about 200 years.