SPACE

# New Space Goal—Mars

**Exploration of Mars has been recommended as the nation's primary future space concern, replacing extensive moon studies and launching of space laboratories.**

➤ THE SPACE SCIENCES BOARD has recommended that the United States make Mars, not the moon, its main concern in space.

But this is not an admission that the Russians have all but won the race to the moon, the board insists.

The board's report, issued to the National Aeronautics and Space Administration, is merely a "refocusing" of its earlier position, a board official told SCIENCE SERVICE.

The landing of men on the moon in this decade is still important, the board contends, as a stepping stone to unmanned explorations of the planets.

The board, a 13-man wing of the National Academy of Sciences—National Research Council, highly recommended scientific explorations of the moon in March 1961.

Two months later President Kennedy announced that a manned moon landing would be the prime target of the American space program.

The U.S. Air Force later began programs for manned orbiting space stations and laboratories.

The board now says that extensive moon exploration and the launching of space laboratories "are not regarded as primary because they have far less scientific importance" than a Mars program.

"However," it added, "both have sufficient merit to warrant parallel programs, but of lower priority."

The report said the Apollo moon program will prove to be important, not because it will put Americans on the moon, but because it will produce the five-million-pound Saturn V rocket which will carry unmanned devices to the planets.

The board suggested that unmanned flights to planets be undertaken between 1971 and 1985, followed as soon as possible by manned flights.

The main task of these flights would be physical and biological investigations, especially the search for extraterrestrial life.

The board called this goal "sufficiently advanced, sufficiently exciting and sufficiently rewarding to seize the imagination of men everywhere."

The board also recommended greater effort in basic astro-physical research into such areas as the recently discovered quasi-stellar sources of enormous radio energy and the existence of localized X-ray sources in space.

Particular attention also was suggested in the far ultraviolet and long radio wavelengths and in the X-ray and gamma-ray wavelengths to find fundamental relationships between the physics of the very large and the very small.

• Science News Letter, 86:339 November 28, 1964

SPACE

# Rocket Fuel 'Tablets'

➤ SOLID-FUEL ROCKETS that use fuel "tablets" like giant aspirin tablets and can be stopped in flight by dousing them with water will play an important part in many of America's space programs.

The tablet-fueled rockets are being tested by Lockheed Propulsion Co., Redlands, Calif., for use in vehicles that will have to be restarted several times in outer space. The tablets can be bunched together in exact numbers and fired bunch by bunch, without the aid of fantastically complex pumps and valves used in liquid-fuel rockets like the Saturn 1B.

A different approach, which may turn out to be even simpler, is one being investigated by Aerojet-General Corporation. They do not even bother with tablets, but instead cast the whole fuel supply in one giant lump, right in the engine casing itself. The problem with a giant fuel lump, however, is stopping it.

A large, exposed, burning surface has to be stopped all at once. A liquid-fuel rocket can be shut off by closing a valve, but there are no valves in a solid-fuel engine.

Aerojet-General Corporation has come up with two solutions. One is almost too obvious: to put out a fire—use water. Water is sprayed onto the fuel-lump from a tank built into the rocket. Very little water is needed, as the process is very rapid.

The other solution is called "nozzle-plugging." Actually, however, it is more like "nozzle unplugging." The sudden opening of a valve causes a rapid decrease in pressure, which puts out the burning fuel.

Among the possible uses for solid-fuel motors might be a personal rocket-pack for an astronaut's use when making in-space repairs on the outside of space stations or space vehicles. Liquid-fuel versions have been designed in the past, but they must depend on pumps and valves to work properly. The simplicity of solid-fuel design is particularly important in such an application.

Dr. Werner Kichner, Aerojet-General's vice president of solid rocket operations, described the back-pack in Washington, D.C.

• Science News Letter, 86:339 November 28, 1964

AERONAUTICS

## Light-Weight Helicopter Hits 'Record' Speed

➤ BUZZING through the air at 200 miles an hour is no great task for most aircraft, but it is a record-breaking speed for "light-weight" helicopters.

A 3,500-pound Lockheed XH-51A was recently clocked at 201 miles per hour, the highest known speed of any helicopter weighing less than 10,000 pounds. At the controls was test pilot Donald Segner, who held the previous high-speed mark for helicopters in this class—186 miles per hour.

The record-holding helicopter was built by Lockheed-California Company under a joint Army-Navy funded program.

• Science News Letter, 86:339 November 28, 1964

TECHNOLOGY

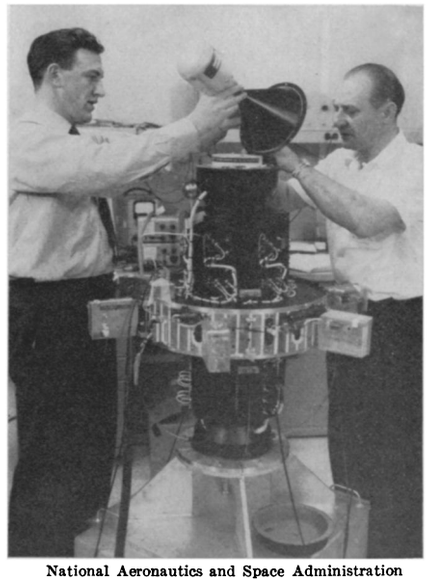
## Supersonic Engine Works With No Moving Parts

➤ THE FIRST successful tests of a "scramjet," or supersonic combustion ramjet, have been completed by the U.S. Air Force.

The scramjet differs from conventional engines in that it has moving parts only in the fuel feeding system and produces thrust by burning fuel in a supersonic airstream.

The 30-inch test engine, a "boilerplate" model, not made to flight specifications, was run under conditions simulating about six times the speed of sound. Future tests will cover still higher speeds and varying altitudes. The tests were carried out at General Applied Science Laboratories, Inc., Long Island, N. Y.

• Science News Letter, 86:339 November 28, 1964



National Aeronautics and Space Administration

*IONOSPHERE MONITORING SATELLITE—Scientists attach an ion mass-spectrometer experiment, contributed by University College, London, England, to this 97-pound satellite that was launched by a Scout vehicle into a circular, near-polar, 620-mile high orbit.*