

SPACE

Safe Space Highway

► A SPACE HIGHWAY around the earth, safe from the greatest hazard to man in space—radiation from solar flares—has been found.

The safety zone in which astronauts could circle the earth lies between the latitudes of about 45 degrees north and 45 degrees south below the Van Allen belts, Dr. Richard Madey, chief of the scientific research staff, Republic Aviation Corporation, Farmingdale, N. Y., reported.

He told the American Astronautical Society meeting in Washington, D. C., that man will be safe from even the largest solar flares if he travels the safe path in an orbit less than 250 miles above the earth. The largest flare ever measured occurred on Feb. 23, 1956.

Up to the 250-mile height, man will also be safe from radiation given off by particles

trapped in the Van Allen belts. The belts are considered a hazard farther away from earth.

The geomagnetic field of the earth acts as a shield by repelling or trapping the solar radiation particles, or protons, Dr. Madey said. The flares are storms on the surface of the sun shooting burning gases into space for millions of miles.

He said the geomagnetic shield is so safe, space trips could be made in this zone without any material shielding. However, the radiation problem encountered outside the safety zone has not been solved yet. The amount of shielding needed, such as lead or some other metal, is high compared to present booster capacity for sending space vehicles into space.

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SPACE

Looking at the Moon

► THE FIRST closeup observation of the moon by a United States spacecraft becomes a reality when an instrument-laden Ranger 3 is launched from Cape Canaveral, Fla.

The 727-pound gold- and silver-plated spacecraft is designed to drop equipment slowly on the lunar surface after a 66-hour flight. During the flight, the craft performs intricate maneuvers in order to fix and hold positions on the sun and earth.

Television shots of the surface are transmitted to earth as Ranger 3 approaches the moon. The composition of the lunar surface is studied by radar. The nerve center of Ranger 3 constantly corrects positions, unfolds antennae, explodes and ejects useless parts, transmits information, and commands all operations of the craft during flight.

An Atlas missile boosts Ranger 3 from its launching pad with the second stage Agena B firing the spacecraft to an orbital speed of 18,000 miles an hour. After a short lapse, Ranger 3 separates from the rocket.

When the spacecraft approaches the moon's surface, radar signals trigger the separation of the rocket and the instrument capsule. At the same time, a retro rocket fires, reducing the capsule's speed to between 80 and 120 miles an hour.

The container erects itself, points its antenna back to earth, and prepares to record and transmit moon information to earth stations, the National Aeronautics and Space Administration reported.

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GENERAL SCIENCE

1963 U. S. Budget

► ROCKETS FOR SPACE and missiles for defense account for almost three-quarters of the \$3.4 billion increase over the present fiscal budget recommended by President John F. Kennedy for the 1963 fiscal year.

The President's 1963 budget request for \$92.5 billion lists among the "new proposals of high priority" improvements in education and scientific research. Among the existing programs, he recommends a highly stepped-up plan for military and economic foreign aid.

The main research effort in space is aimed at developing the complex Apollo spacecraft and the large boosters for sending a man to the moon. However, far more significant than the achievement of manned space flight itself is, the President emphasized, "the tremendous technological advances" necessary to permit such flight. They "will have great impact . . . throughout the economy."

With increasing emphasis on all aspects

of space exploration, a well-developed space technology might serve to facilitate the economic transition that would be demanded if an agreement on world disarmament were to be achieved.

While the accent is on man in space, the Administration also has stepped up plans for unmanned space exploration. For the 1962 calendar year (1963 fiscal year beginning July 1, 1962), the moon and Venus will be targets. Plans include a lunar landing of an instrumented capsule by means of the Ranger spacecraft, to be followed by the Surveyor spacecraft probe that will be capable of either landing on or orbiting the moon. A Mariner spacecraft will be launched in the vicinity of Venus to be followed by a more advanced model to investigate Mars. World-wide satellites for weather observations and communications are underscored in the budget.

The budget allotment for defense, which

totals more than half of our national spending, lists advancing development of strategic retaliatory hardware as a "major program," including manned bombers, their tankers and air-launched missiles; intercontinental ballistic missiles; Polaris submarines and missiles; and communications systems for command and control.

The budget also calls for the development, testing and procurement of the new Skybolt air-launched ballistic missile that has twice the range and many times the speed of the Hound Dog air-to-surface missile with which most of the B-52s will soon be equipped.

The civil defense program will require \$460,000,000 for Federal incentive grants for shelter construction in selected community buildings such as schools and hospitals. This amount, included in the budget, will be called for in legislation being prepared by the Administration for Congressional approval. While this is bound to be a subject for controversy, the Administration is fairly sure of getting the necessary majority vote.

The budget also reflects the legislative recommendations, currently pending in Congress, to provide a substantial increase in aid for medical education and to enact health insurance for the aged through social security. There is a good chance that the aid for medical education will get Congressional approval but chances for health insurance for the aged appear less favorable.

The 1963 budget calls for considerable expansion in health services and research, "with increased emphasis on skills needed in mental health work." Most of an estimated \$1.4 billion is to be spent by the National Institutes of Health.

Federal expenditures for hospital construction are estimated to reach an all-time high of \$196,000,000 during 1963.

Funds for the Food and Drug Administration will provide for expanded research on air and water pollution, and radiation exposure.

The President has proposed a new and expanded program for education to cope with present manpower problems. One out of 16 workers is unemployed while there is a growing serious shortage of scientists, teachers, physicians and other professional personnel.

The budget also provides for legislation introduced by the Administration last year for an increase in teachers' salaries and assistance for elementary and secondary school construction; assistance to science education and basic research; and for college scholarships and construction and modernization of academic facilities.

A record level of \$2.3 billion is estimated for the national resources program for 1963. The major share is for land and water resources. Basic research to convert saline water to fresh water will be expanded.

Expansion of oceanography research and increase in atomic energy programs also will require some increases over fiscal 1962 estimates.

The 1963 budget emphasizes research and development in all areas more than any previous budget.

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