

THE FIRST MAN-MADE PLANET

Russian Rocket Launched into Solar Orbit

THE greatest step forward in astronautics since the launching of Sputnik 1 on October 4, 1957, was the Soviet firing, on Friday, January 2, 1959, of the first rocket ever to escape from the Earth's gravitational field. Known unofficially as Planet 3, the rocket passed within 5,000 miles of the Moon and went on to become the first man-made object to begin an orbit around the Sun—at a mean distance from the Sun of roughly 100 million miles and with an estimated orbital period of 15 months.

The first announcement of the launching was given by Moscow Radio on the night of January 2. After recalling the launching of the Soviet Earth satellites, the statement continued:—

"As a result of further creative work on the part of Soviet scientists, designers, engineers and workers a multi-stage rocket, the last stage of which can reach a second cosmic speed of 11.2 km per sec (about 7 miles per sec), making interplanetary flights possible, has now been created. On January 2, 1959, a cosmic rocket was launched towards the Moon in the U.S.S.R. The multi-stage cosmic rocket has come out according to programme on the trajectory of its movement in the direction of the Moon. . . .

"According to preliminary calculations, which are being made more precise by direct observation, the cosmic rocket will reach the area of the Moon at approximately 07.00 hr Moscow time (4 a.m. G.M.T.) on January 4. . . .

"The last stage of the cosmic rocket, weighing 1,472 kg (3,245 lb) without fuel, is equipped with a special container, inside which are placed the measuring instruments for carrying out the following scientific observations: the ascertaining of the magnetic field of the Moon; the study of the intensity and the variations of the intensity of cosmic rays outside the magnetic field of the Earth; the registration of photons in cosmic radiation; the discovery of the radio-activity of the Moon; the study of the distribution of heavy nuclei in cosmic radiation; the study of the gas components of interplanetary matter; the study of corpuscular solar radiation; and the study of meteoric particles."

The statement said that radio transmitters working on four frequencies were relaying to Earth the data obtained. Among the instruments were some designed to create a sodium cloud which would be released during ascent to form an artificial comet visible from the Earth. The total weight of the instrument payload, including batteries and container, was 361.3 kg (296.5 lb).

The statement also said that the rocket was carrying pennants with the coat of arms of the U.S.S.R. and the inscription "Union of Soviet Socialist Republics, January 1959." The announcement concluded: "The workers of scientific research institutions,

designing bureaux, plants and testing organizations who have created the new rocket for interplanetary communications dedicate this launching to the 21st Congress of the Communist Party of the Soviet Union."

At 2.59 a.m. G.M.T. on Sunday, January 4, according to the Soviet news agency Tass, the rocket passed 4,660 miles west of the Moon with all instruments and radio transmitters functioning normally. Its speed at that time was some 5,500 m.p.h. At 9 a.m. G.M.T. the same day, it was 265,000 miles from Earth (and 37,500 miles from the centre of the Moon). The internal temperature and that on the exterior of the rocket were both reported as 10-15 deg C.

The Tass statement added: "With the growing distance between the rocket and the Earth, as well as under the influence of the extinction of energy sources aboard the rocket, the radio contact with the rocket will gradually become more and more difficult, and possibly cease within the next 24 hours. . . . As the cosmic rocket recedes from the Earth and the Moon their influence on the rocket's movement will weaken. The movement of the rocket will, to an ever-increasing degree, be determined only by the force of attraction of the Sun. The rocket will enter into its final elliptical orbit round the Sun, thus becoming the very first artificial planet of the solar system. In practice this will occur as from January 7-8."

On January 14, the agency stated, the rocket would be about 91.5 million miles from the Sun—its closest position—and at the beginning of September the maximum distance from the Sun, about 122.5 million miles, would be reached. The time for one revolution would be 15 months.

On Monday, January 5, Tass reported that radio contact with the rocket had been lost that day at 7 a.m. G.M.T., at which time the rocket's distance from Earth had been 371,000 miles. The rocket was continuing its flight, the statement said, but "the programme of tracking the rocket and the scientific research connected with it have been thereby closed." The tasks laid down at the launching of the rocket had been completed, and the scientific results obtained would be published.

Among messages of congratulation on the Russian achievement was one from Mr. Harold Macmillan, the Prime Minister, and one from President Eisenhower. Informed opinion was that the accuracy of guidance of the rocket was even more impressive than the provision of its power—although it was recalled that no advance statement was given of the rocket's destination. As to the probable life of the rocket, this should be measured in millions of years.

SAFE MECHANISMS

A MAIN lecture of the Royal Aeronautical Society, entitled *Safe Mechanisms*, was due to be given by Mr. Raoul Hafner, chief designer (helicopters) of Bristol Aircraft, in London yesterday, January 8. Although considerable advances had been made during the evolution of fixed-wing aircraft in the design and production of light and safe structures, Mr. Hafner's paper submitted, mechanical components had not received the same attention. They had been regarded by the structures expert as unreliable, but this point of view could not be supported by facts.

The paper was mainly concerned with the fundamental properties of mechanical components in the light of the safety concepts that had been evolved with modern aircraft structures. The cost of safety, the fault and failure relationship, and methods of inspection and design principles which effected this relationship were also discussed. Examples of "safe" mechanical components were given as well as a complete "safe" transmission system for a helicopter. Mechanical components, the paper claimed, could be made adequate for the vital role which they would be called upon to play in the ensuing phase of aeronautical evolution.

SPACE FOR YOUNG PEOPLE

AT the Royal Society of Arts last Tuesday, January 6, Dr. L. R. Shepherd, chairman of the British Interplanetary Society, gave a talk on *Rocket Flight in Space*. The occasion was the 1959 Young People's Lecture organized by the Royal Aeronautical Society.

Dr. Shepherd's lecture gave a simple account of the operation and construction of solid- and liquid-propellant rockets. He described briefly the Earth's surroundings in space and the use of rockets to overcome Earth's gravitational pull. The problems of launching artificial satellites and space probes were also detailed.

Man would take part in the exploration of space and the planets, Dr. Shepherd said, but the need to provide for his safety and his

safe return to Earth created a number of difficult problems. These were outlined by the speaker, who concluded his talk by stressing the necessity for new and more powerful methods of propulsion in space. This, he emphasized, would almost certainly involve the application of nuclear energy.

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NOW available is the first issue of *Data Processing*, a journal designed to cover the needs of management and administration executives in search of practical information about the application of electronic computers and associated equipment to their own particular problems.

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BROUGH PROSPECTS

IN his New Year message to Blackburn and General Aircraft employees, the chairman and managing director, Mr. Eric Turner, said that with the NA.39 and its developments alone he believed that prospects of employment with the company, all being well, were good until the mid-1960s. He added that a "major disappointment" of 1958 had been that no decision had been made on the B.107, but expressed the hope that Blackburn's experience with this class of aircraft would "eventually receive official recognition."