GEOPHYSICS

Compare "Moon" Programs

The successful launching of the Russian satellite was the result of a "crash" program in satellite research in which speed, not perfection, was the goal.

➤ THE RUSSIANS crashed through on the satellite just as they have on other programs that bring them into intense competition with Americans. There is a different method of getting things done in the Russian and American worlds.

In the case of the satellite, the Russians seem to have used their Intercontinental Ballistic Missile to fling it high enough and with enough velocity to get it into an orbit.

A special rocket to launch the U. S. satellites is being built, paralleling the development of war rockets. Moreover, there are a multiplicity of war rockets in the U. S. program, rather than a concentration upon two or three. Our rocket scientists have been perfecting a variety of mechanisms to be placed in their satellites, instead of concentrating upon scoring a "first" in getting an artificial moon traveling around the earth.

In the long run, the U. S. program will undoubtedly give more solid information about the upper atmosphere, solar ultraviolet radiation, cosmic rays and weather patterns on earth than the Soviet observations. But the U. S. perfectionist attitude has lost a first in satellites for our side.

Much the same thing happened in atomic power. The Russians rushed a power-producing plant without too much regard for some of the safety factors. We went more slowly with more testing, care and safety. For one thing, we did not need the power as such, and we had scored a resounding first in the atomic and hydrogen bombs. Over the course of years, we shall do quite as well as the Russians and probably a great deal better.

Earth's Companion

➤ HERE IS a resume on just what facts are known about the Soviet's satellite, sputnik:

Size and weight: It is a sphere 22.8 inches in diameter, weighing 184 pounds. About 30 or 40 pounds of this weight, it is estimated, are accounted for by the batteries used for power to send signals.

Launching Site: Western scientists have not been able to calculate the launching site in Soviet Russia and Russian announcements have not given this information. The estimated time of the launching was Friday, Oct. 4, at 5:05 p.m. EDT.

Orbit: Sputnik's path around the earth is elliptical and ranges from 300 to 400 miles above the earth. However, its orbit is changing. At launching, the Russians announced, its orbit was inclined at an angle of 65 degrees to the equatorial plane, thus carrying sputnik over the polar regions.

Speed: Sputnik is circling the earth at 18,000 miles per hour. It makes 15 passes within 24 hours, or one every 96 minutes.

Signal: Two radio transmitters continuously emit signals of 20.005 and 40.002 megacycles frequency which are sent in the form of telegraph messages lasting about three-tenths of a second. These radio impulses or "beeps" are in the key of A flat, reports one scientist. (See p. 245.)

Visibility: Sputnik can best be seen with the naked eye at sunrise and sunset. Reports of its brightness range from something comparable to the North Star's brightness to as bright as the dimmest star in the Big Dipper's handle.

Cost: Western scientists estimate that over the last five or six years the Russians have spent $14,000,000,000 on their earth satellite program.

What does "sputnik" mean? One translation might be traveling companion. "Putj," in Russian, means "the way" and "putnik" is someone who goes on a journey. The earth is a putnik. The Russian satellite is accompanying it and is a sputnik.

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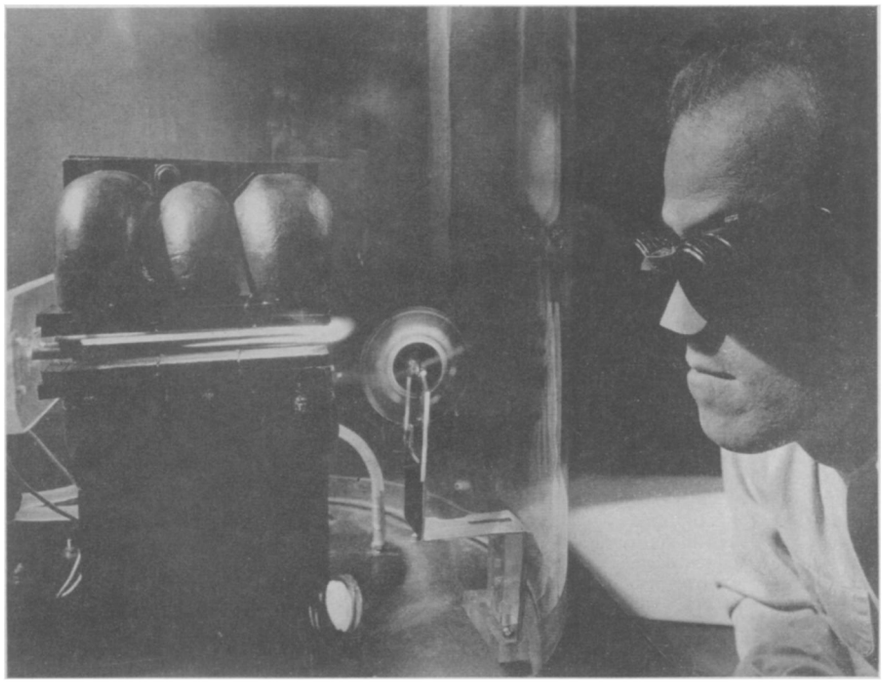

ION JET—A miniature laboratory ion-propulsion model, operating at near vacuum conditions, produces thrust which is detected by the small wheel behind the jet. An ion jet is produced when charged particles are formed in an electric discharge between two electrodes and are accelerated by a magnetic field.

AERONAUTICS

U. S. Studying Ion Power For Future Satellites

➤ SATELLITES of the future will be controlled and accelerated in their orbits and sent into outer space by streams of ions when such a propulsion device is developed by National Advisory Committee for Aeronautics. Research on such a device was reported in Cleveland, Ohio, as being under way.

Use of ion streams is still very much in the future but a new apparatus demonstrates how portions of atoms, bits of matter carrying electrical charges, can be propelled to high velocity by use of electric and magnetic fields.

Due to the fact that there is no air in outer space that will allow air-breathing engines to operate, a propulsion device capable of operating in a vacuum must be perfected.

The ion streams, which do have a considerable amount of thrust, are therefore an attractive and possible means for powering an outer space device.

The NACA engineers definitely visualize using such a method to apply energy to future satellites and to change them in their orbits. This would be a way to take a satellite out of its orbit and propel it on its way into outer space such as would be necessary on attempts at travel beyond the earth other than simply moon-like swings around the earth.

An electric arc, which gives a high current discharge such as is visualized for future use, also approaches a high speed stream of particles at temperatures of 10,000 to 20,000 degrees Fahrenheit. This allows the scientists to study temperature conditions under which a satellite must re-enter the earth's atmosphere.

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