GEOPHYSICS

Sputnik Has Long History

Although the launching of the Russian's satellite was probably the result of a "crash" program, is was preceded by more than a half century of research in rocketry.

➤ THE RUSSIANS credit their own rocket scientists historically for the research that culminated in the launching of the earth satellite sputnik.

Chief recipient of Russian honors is, in the Russians' own words, "the modest Kaluga schoolmaster," Konstantin Tsiolkovsky. This early Russian astronaut was making space travel calculations at the turn of the 20th century. Working at about the same time on similar plans, but independently, were Prof. Robert Goddard of the United States and Hermann Oberth of Germany.

In 1903 Tsiolkovsky published what is considered a classic work in the field of interplanetary travel called *Exploration of the Spaces of the Universe by Jet-Propelled Instruments.* In his book, Tsiolkovsky showed the advantages of the rocket for use in a spaceship and designed the basic features for such a craft.

Tsiolkovsky is generally credited by rocket experts even in this country with proposing a liquid-propellant rocket engine and being the first both to present a mathematical flight theory and to propose oxygen and hydrogen as rocket propellants.

Following Tsiolkovsky, the Russians credit a pair of scientists, F. A. Tsander and Yu. V. Kondratyuk with contributing heavily to the early rocketeering by proposing the use of solid metal fuel for rocket engines. Tsander, they say, during the 1920's and 1930's published several works on the use of interplanetary rockets, particularly rockets which consumed part of themselves for fuel. He published his chief findings in 1932 in a book entitled *The Problem of Flight by Means of Jet-Propelled Devices.*

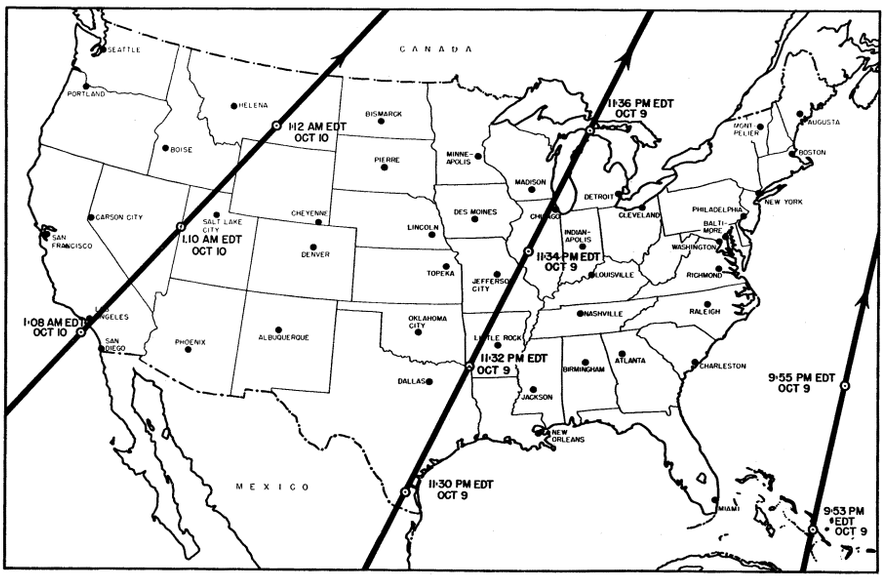
Kondratyuk, also concerned with composite rockets, worked out a theory of flight, take-off factors and suggested the use of a landing glider to act as a brake on an interplanetary rocket on its descent back to earth.

Each of the three early Russian rocket experts were concerned with the establishment of an earth satellite that could be manned and operated as a scientific station. All drew up plans for sending parts of such a station into outer space in rockets so that the rockets could be joined together to form the station.

It is interesting to note that the Germans during World War II overran Tsiolkovsky's old laboratory located in the suburbs of Moscow.

Although the Russian rocket scientists and equipment had already been evacuated to Sverdlowsk in the Ural Mountains, the Germans found evidence to indicate the Russians were carrying on an active rocket research and development program even before World War II.

Science News Letter, October 19, 1957



SATELLITE'S ORBIT—This map of the United States shows the predicted orbits of the Russian satellite sputnik for the dates Oct. 9 and Oct. 10. Between each pass, represented by the heavy black lines, the orbit shifts approximately 24 degrees west at the equator. Radio-tracking equipment and information supplied by the Mini-track stations provided the data used by the U. S. Naval Research Laboratory in compiling the map.

● RADIO

Saturday, Oct. 26, 1957, 1:45-2:00 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. James A. Reyniers, research professor of bacteriology, University of Notre Dame, Ind., will discuss "Germ-Free Life." This program had been scheduled originally for October 19.

GEOPHYSICS

Here's How to Hear The Russian Satellite

➤ SHORT WAVE radio listeners who wish to hear the radio signals coming from the Russian satellite can quickly find the correct setting on their dial by locating radio station WWV.

This station is operated 24 hours a day by the National Bureau of Standards in Washington, and transmits a continuous series of clicks spaced one second apart. Every three out of five minutes a low pitched tone is added over the clicks.

WWV transmits on several frequencies at the same time, but the important one is 20 megacycles. The Russian satellite is transmitting at both 20.005 megacycles and 40.002 megacycles.

After WWV is located the radio dial should be turned just a fraction of an inch toward the higher frequency side, that is, toward 21 megacycles.

The satellite's signal is easy to recognize since it is a continuous series of "beeps," three-tenths of a second long, each followed by a pause of the same duration.

The signal will be strongest when the satellite passes over your section of the country and will then rapidly fade out as it spins on toward the poles.

Station WWV makes a handy reference point because many times the markings on the radio dials are not exact. WWV is always exactly on 20 megacycles.

Science News Letter, October 19, 1957

GEOPHYSICS

Satellites' Lifetimes Halved by New Data

➤ SATELLITES, including the Russian one now circling the earth, may live a shorter time than estimated because of electrostatic drag that seems to have been ignored in earlier calculations.

Two scientists from the Naval Research Laboratory, R. Jastrow and Cabell A. Pearse, have estimated the effect of the picking up of negative charges by the sphere as it moves through the ionosphere. They figure that the drag on the satellite due to this cause will about equal that due to the collisions with neutral air particles.

The catch is that estimates of satellite lifetimes have ranged from several weeks to about nine years and a halving of these estimates does not sharpen materially predictions as to how long the Russian satellite will remain in the sky.

The new estimates are reported in *Astronautics* (Oct.), publication of the American Rocket Society.

Science News Letter, October 19, 1957