GEOPHYSICS

Second U.S. Moon Up

The United States has launched its second earth satellite, this one a small test satellite, powered by the Navy's Vanguard rocket, that is circling higher than any other "moon."

➤ THE SECOND earth satellite to be launched successfully by the United States entered into orbit at approximately 7:26 a.m., March 17.

The test satellite went nearly 1,000 miles farther into space than had been expected. Since all three rocket engines performed better than expected, Dr. John P. Hagen, director of the project, said, this gave the satellite an extra burst of velocity. Its speed approached 19,000 miles an hour.

The "baby moon," which together with the third stage rocket weighed more than 50 pounds, is expected to be a very long-lived satellite. Estimates of how long it will continue to circle the earth range from five to ten years. Latest information concerning its orbiting time and maximum height above the earth are: speed, 18,000 to 19,000 miles an hour; maximum height, 2,466 miles; minimum height, 404 miles; time for making a complete circle of earth, 134 minutes.

Containing two miniature radio transmitters, one operating on 108.00 megacycles, the other on 108.03 megacycles, the aluminum sphere satellite is also expected to transmit radio signals for a "long time". One of the transmitters operates on solar batteries and it operates only during daylight.

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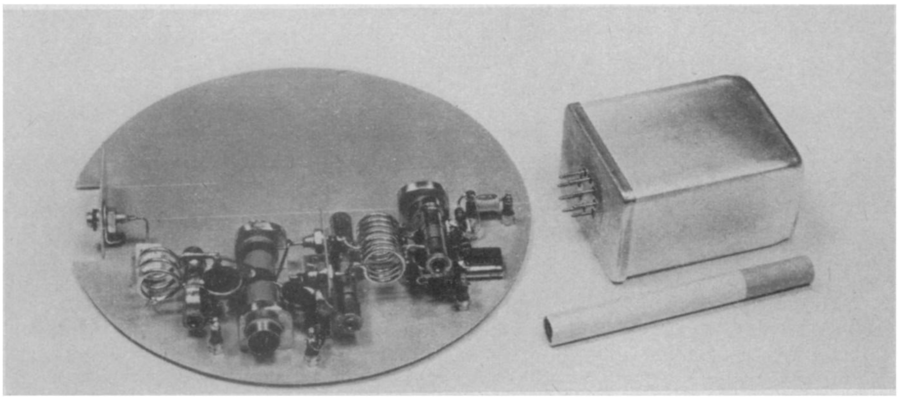
How the Satellites Compare

	Vanguard	*Explorer I*	*Sputnik I*	*Sputnik II*
Weight (in pounds)	3.25	30.8	184	1,120
Shape	sphere	tube	sphere	cone
Size	6.4" diameter	80" long	22.8" diameter	15' long
Launcher Thrust (in pounds)	40,000	83,000	250,000 to 395,000	
Maximum Altitude (in miles)	2,466	1,575	560	1,025
Minimum Altitude (in miles)	404	227	140	140
Orbit Time (in minutes)	134	114.95	96	103.7
Launching Date	March 17, 1958	Jan. 31, 1958	Oct. 4, 1957	Nov. 3, 1957



SATELLITE TRANSMITTER—A small, powerful radio transmitter that may be used in future U. S. satellites has been designed weighing less than three ounces but capable of developing 500 milliwatt broadcast power. The version at the left shows how the transmitter would fit into a satellite or missile. Optional packaging at the right would put the three-transistor transmitter in a compact unit that could fit into a pocket. Developed by DuKane Corporation, St. Charles, Ill., the transmitter uses one-fourth to one-fifth the battery power needed for a tube-type circuit.

● RADIO

Saturday, April 5, 1958, 1:30-1:45 p.m., EST

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

Mr. Armig G. Kandoian, director, Radio Communication Laboratory, Federal Telecommunications Laboratories, Nutley, N. J., will discuss "World Wide Communications."

ROENTGENOLOGY

Simpler Method for Reading X-Ray Effects

➤ A SIMPLE and direct method by which the instantaneous effects of X-rays can be measured has been found.

The method may eventually lead to a general chemical protection against X-ray harm, Drs. R. Brinkman and H. B. Lamberts of the Physiological Institute, University of Groningen, The Netherlands, report in *Nature* (March 15).

Their method consists of studying the X-ray influence on the substances between the cells of the body. This was accomplished by measuring the amount of viscosity, or stickiness and thickness, of synovia (a fluid in the joints, tendon sheaths and bursae) after exposure to X-ray treatment.

Salt solution was injected into several types of tissue after which varying amounts of irradiation were directed upon the tissue. The injection needle registered the changes in pressure, or viscosity, of the synovia as several strengths of X-ray were applied.

Moderate irradiation dosage, 500 roentgens, reduced the viscosity of the synovia by 20%, the doctors report. Decreased dosage resulted in a higher degree of viscosity.

Therefore, since the viscosity varies with the amount of X-ray dosage, a change in the viscosity is a reflection of the administered X-ray dose. Coupled with the salt solution injection, this method of reading the viscosity reveals the amount of resistance to irradiation treatment by cell-surrounding substances.

The scientists point out that with a fine needle inserted well into the connective tissue of the skin, these "phenomena are easily reproducible and well-suited for the investigation of local chemoprotection. The results may be valuable for a more general chemoprotection."

This simple method of reading resistance may open new doors to determine the exact effect of some of the chemicals now used for X-ray protection. Many of the dozen or so chemicals now being used have never been accurately tested to determine how successfully they do protect.

By administering a chemical thought to protect, then applying the method described above, the viscosity change can be read instantaneously as X-ray treatment is applied. As the viscosity decreases, the amount of protection does also.

Perhaps scientists will soon have a competent check for chemico-protection through the use of this method.

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