

SPACE

Tiros V Launch Success

➤ NEITHER WEATHER nor technical delays have interfered with the successful launch of all U.S. weather satellites.

The successful launch of Tiros V, a satellite primarily designed to watch hurricanes and storms, marks a "workhorse satellite era," National Aeronautics and Space Administrator James E. Webb said in Washington.

Mr. Webb also hailed the Thor-Delta booster as among the most reliable family of rockets built by the United States. The three-stage combination liquid-solid fuel rocket has performed successfully in nine out of ten launches. All launches were NASA experiments and included Echo, Explorer and the Orbiting Solar Observatory (OSO) as well as the Tiros satellites.

Tiros V already has photographed a storm vortex in Newfoundland. Its schedule will bring it over the Northern Hemisphere hurricane and typhoon belt during the hurricane season in August.

Its period of elliptical orbit is 105 minutes; its inclination is ten degrees higher than

previous satellites which will allow it to take cloud pictures above the Antarctic and the Arctic, and northern areas such as Alaska and Greenland.

Tiros V should be able to take pictures of the atmospheric effects of high altitude U. S. H-bomb explosions scheduled this summer. It may not, however, be in a position to take pictures of the actual blast. Infrared sensors (not aboard Tiros V) on the still orbiting Tiros IV will give additional data on the H-bomb tests in space.

Tiros V has three main objectives: 1. to continue photo-weather coverage by satellites (Tiros IV cameras ceased functioning June 10); 2. provide observations of hurricanes from mid-August to the end of September, and 3. provide additional observation and coverage.

Two or three more Tiros satellites will be launched at four-month intervals. These will be followed by the Nimbus series in polar orbits.

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SPACE

Space Cooperation Near

➤ SPACE COOPERATION between the United States and Russia should begin actively within the next three years with the establishment of World Weather Watch centers in Washington and Moscow, SCIENCE SERVICE learned.

The world centers will have access to all meteorological satellite data as well as the more usual meteorological observations made from land, sea and planes. At the request of both countries, the World Meteorological Organization will coordinate the international activities of the world centers as well as regional centers to be set up later in Europe, Asia, Africa and other areas. This coordination will prevent unnecessary duplication of effort since it will make possible the transmission of all data to each national meteorological service.

To obtain the maximum benefit from meteorological satellites, present gaps in the network of more conventional meteorological observations must be expanded. Both the U.S. and USSR have agreed on a minimum network plan which includes automatic surface weather observatories and 53 new upper air observatories, of which 20 will be on ships at sea.

The cost of purchase and installation of equipment is estimated at over \$35,000,000. Annual operation will require \$16,500,000. Funds will have to be implemented from international sources since many of the more underdeveloped nations otherwise could not participate. The U.S. and USSR, in their report, suggest that a World Weather Fund be established by the United Nations "to support the implementation of the WMO action."

At the two world centers, to be supported largely by the countries in which they are located, special computer equipment to process and compile the worldwide data as well as increased telecommunication facilities will be set up.

Coordination of types and scope of observations as well as orbits of meteorological satellites will be recommended by the WMO.

Cooperation in space for weather research is considered a major step forward toward an ultimate program of cooperation in all space ventures by Dr. Harry Wexler of the U.S. Weather Bureau who worked on the program with the Russians at Geneva.

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PSYCHOLOGY

Setting Moon Looks Big Since It Seems Far Away

➤ IF THE RED setting moon, as seen over your sweetheart's shoulder, looks as big as "a big pizza pie," it is not necessarily "amore." It is a well known optical illusion.

Experiments explaining just how your eye is fooled are reported in successive issues of *Science*, 136:953, 1053, 1962, by two psychologists, Drs. Lloyd Kaufman, Sperry Gyroscope Company, Great Neck, N. Y., and Irvin Rock, Yeshiva University, New York, N. Y.

The experiments give greatest support, Dr. Kaufman told SCIENCE SERVICE, to the explanation that land objects—trees, houses, hills and fields—make the moon at the horizon seem farther away than when in

the empty sky overhead. When two objects are the same size, if one is farther away it will look smaller. For the same reason, when two objects are seen as the same size (as the moon in two different positions in the sky), if you perceive one to be farther away than the other you will be fooled into thinking that it is larger.

This is substantially the same theory published by the Egyptian astronomer Ptolemy in the second century A.D.

Other theories held in the past were exploded by the scientific experiments. Photographs of the moon in different positions in the sky showed no size difference. This demonstrated that the illusion has nothing to do with refraction, or bending of the light rays in the atmosphere.

Prisms were used so that the observer looked straight ahead to the overhead moon and looked up to see the moon on the horizon. This took care of the theory that the raising of the head or the eyes was the cause of the illusion.

The illusion was found over the ocean where there are no trees or houses, but the rough surface of the ocean water does create the impression of distance to the horizon.

By the use of prisms, the experimenters turned the world upside down for the observer, thus reducing the impression of distance. This resulted in a reduction of the illusion.

The illusion was also found to be stronger when the sky is cloudy.

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PSYCHIATRY

25% of Mental Hospital Admissions Voluntary

➤ ONE-FOURTH of all new patients entering a mental hospital do so at their own request. The rest are admitted by physician's certification or through court commitment.

Voluntary admissions are still low in the United States compared to European countries. In England, more than 70% of mental hospital admissions are voluntary.

The National Association for Mental Health and the American Psychiatric Association report that psychiatrists favor voluntary admission because the patient is then more likely to take part in his treatment.

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HORTICULTURE

Compact Soil Bends Roots, Stops Upward Growth

➤ HARD SUBSURFACE layers of soil can stop plant growth in all directions, the American Society of Agricultural Engineers learned in Washington.

It is not the restriction of air or water that causes damage, but the sheer hardness of the layers to keep the roots from penetrating, Dr. H. M. Taylor, Dr. Earl Burnett and N. H. Welch, U.S. Department of Agriculture scientists, reported. They found that root growth was hindered when they could not pass through two-inch compacted layers.

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