

Satellite Broadens World Cloud Study; New Finding Hinted

By HAROLD M. SCHMECK JR.

The United States orbiting weather eye continued yesterday to transmit pictures of the earth's cloud cover.

The weather-scanning satellite has gathered views of cloud cover from many parts of the world, a spokesman for the National Aeronautics and Space Administration said.

The space agency also released yesterday further pictures taken by the satellite from its altitude of more than 400 miles above earth. The new print showed two shots of cloud cover over the East Coast at 2 P.M. Friday. At this time the satellite was over Fort Monmouth, N. J.

An official said the new pictures had been taken with the satellite's high-resolution camera, which has a smaller field of view, but greater definition, than the camera that took the first pictures to be released.

Transmit to 2 Stations

It was estimated yesterday that as many as 250 photographs might have been taken. However, not all the information has been transmitted to earth on command from two American ground stations.

One is at Fort Monmouth, the other at Kaena Point, Hawaii.

The Space Administration official said that the Fort Monmouth station had interrogated the Tiros I satellite four times yesterday morning. One session provided pictures of cloud cover over the Mediterranean, another over the Great Lakes region.

The areas covered during the other two transmission sessions were not reported.

There were indications also that the satellite might already have caught meteorologists something new about the weather.

In Washington, Dr. Harry Wexler, director of research of the Weather Bureau, said that close looks at the first pictures taken by the Tiros I satellite had hinted of a phenomenon not previously proved to exist in non-tropical storms.

The first pictures, he said, seemed to show evidence of a double vortex associated with the storm now centered off the New England coast. Such double vortices have been known in tropical storms, but they have not previously been proved to exist in non-tropical storms, Dr. Wexler said.

There has been speculation about such double vortices in meteorological literature.

Dr. Wexler said the photographs would have to be analyzed carefully. The growing collection of Tiros cloud photographs, he remarked, will keep specialists busy for some time.

"It gives us a completely new

look, from above, of the cloud picture that we ordinarily see only by a worm's-eye view, so to speak," he said.

A less enthusiastic view was expressed today by Dr. Harlow Shapley, former Professor of Astronomy at Harvard, in an address before a convocation of Lafayette College at Easton, Pa.

Dr. Shapley expressed doubt that the new satellite would make the weatherman obsolete.

"Local conditions cause most of our weather and it will be a long time before the satellite can bring about exact forecasts," he asserted.

Dr. Shapley conceded that the satellite would have value in long-range predictions.

The 270-pound cloud-scanning satellite has the capacity for taking thirty-two pictures automatically during a brief period of each 99.15-minute orbit, a spokesman for the Space Administration said yesterday. Further pictures can be taken on command during the twelve minutes or so when the satellite is within range of either control station.

The satellite has two television cameras, each no larger than a water glass, which were built by the Radio Corporation of America.

One of these has a wide angle lens, which gives it a huge view, approximately a square 800 miles on a side.

Data on the other, narrow view, camera has not been officially divulged. It is believed to have a thirty-mile-by-thirty-mile view and considerably greater definition than the other camera.

TIROS A PRODUCT OF REFINED SKILLS

Electronic Equipment Is So Sensitive Rate of Spin Is Controlled From Ground

By WALTER SULLIVAN

Tiros I, the weather satellite launched early Friday, is a marvel of electronic ingenuity so refined that even its spin rate can be controlled from the ground.

Around the rim of its base plate are eighteen tiny rockets that can be fired, in opposite pairs, by radio command. Around its sides are nine electronic eyes peering out through narrow slits in search of the sun.

When each picture is recorded on magnetic tape, a record is also made of the sun's direction. When this is received on the ground at Hawaii or Fort Monmouth, N. J., it is fed into a "sun angle computer." It is also displayed on the television screen alongside the picture to indicate which direction is north.

Another set of instruments on the satellite rim senses infrared radiation from the warm earth. Each detector transmits only when it can see the earth. This makes it possible on the ground to fix the spin rate and axis of the drum-shaped vehicle.

Rate of Spin Slowed

At separation from the third-stage rocket on Friday the satellite was presumably spinning at about 120 revolutions per minute. Two weights were then released and flew out to the ends of two cables on either side, slowing the spin to twelve revolutions per minute. At that speed they slipped off specially designed hooks and flew away. To correct any wobble a system of traveling weights on rods was released within the vehicle.

It was expected that the earth's magnetism might slow the spin below the desired twelve revolutions. The eighteen miniature rockets make it possible to correct this from the ground.

Because the earth rotates within the Tiros orbit, on three or four of its daily trips around the earth the satellite may not come within radio range of one of its control stations. On the other orbits a rapid series of radio pulses from the ground sets a timer on the satellite that snaps the cameras at the right moment.

The satellite instrumentation and its electronic ground system were designed by the Radio Corporation of America. The television cameras, resembling water tumblers in size and shape, are identical, except that one has a wide-angle lens.



Associated Press Wirephoto

CLOUDS VIEWED FROM ABOVE: This picture of a cloud cover over the East Coast was taken by the Tiros I satellite at 2 P. M. Friday and transmitted to Fort Monmouth, N. J. The satellite was then about 400 miles above tracking station. Of Tiros' two TV cameras, one with the smaller field of view, but greater definition, was used.