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SATELLITE RELAYS EARTH IMAGE

A crude image of part of the earth's surface and cloud cover has been made from signals received from the Explorer VI earth satellite launched August 7, 1959.

The picture covers a broad area of the central Pacific. It was made from signals received by the South Point, Hawaii, tracking station on August 14. At the time of transmission, Explorer VI was about 17,000 miles above the surface of the earth--crossing Mexico. Thus the area photographed was more than 20,000 miles from the satellite.

The two-pound camera device which took the picture was made by Space Technology Laboratories, Inc., of Inglewood, California, the major industry contractor involved in the satellite experiment conducted by the National Aeronautics and Space Administration in cooperation with the U. S. Air Force Ballistic Missile Division (ARDC).

While the earth was in the camera's field of view, the relative positions of earth, sun and satellite allowed only a crescent of the sunlit earth to be seen. The southern-most portion of the crescent pictured was not obtained because the transmitter was turned off. The black indentation in the

upper right portion of the crescent was caused by loss of data.

A 40-minute signal transmission from which the picture was made was received between 0105 and 0145 Universal (Greenwich) time, August 14. So actually the picture signals were received in Hawaii at 3:45 p.m. Hawaii time on the afternoon of August 13.

At the time, the central portion of the Pacific was lighted while the North American continent was dark and Asia land masses were over the satellite's horizon.

In the image, scientists can discern cloud banks in the large white areas at the upper and lower parts of the crescent. The white area near the horizon in the equatorial region is believed to be sunlight reflected from the atmosphere or ocean.

An extremely small video bandwidth, 1.5 cycles per second, was employed to transmit the picture to earth. In contrast, commercial TV requires a bandwidth of about 4 million cycles per second. The difference is that a commercial television system transmits a complete picture in 1/30 of a second, whereas the earth image received from Explorer VI required 40 minutes for transmission.

The STL open lens camera consists of two parts: a tube containing a mirror which receives and focuses light and dark impressions and an electronic counter which computes and records the impressions before they are converted into radio signals. The payload is spinning about 2.5 times per second to give it stability. Once per revolution the camera unit records the light or dark impression that it sees in the form of a coded electrical impulse. The impulse can be reduced to a single dot.

A row of dots forms a line and eventually the lines form an image.

While the image is obviously a crude first effort, it does prove the system is feasible.

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