

SCIENCE/SCOPE

Round-the-clock commercial communications with the Far East was inaugurated January 26 over COMSAT's Intelsat II. Hovering in synchronous orbit 22,300 miles above the Pacific, new satellite is relaying telephone, Teletype, data, and television between the U.S. and Hawaii, Japan, and Australia. It will also be used by NASA to support the Apollo moon-landing program. Intelsat II has three times more transmitter power, five times greater bandwidth, and substantially broader antenna-beam coverage than COMSAT's Early Bird, also built by Hughes.

Air defense umbrellas for major U.S. metropolitan areas are now being maintained by the Army's new Missile Mentor computer systems, developed by Hughes. The Mentors detect and track all aircraft in the defense areas, give commanders more data for split-second battle decisions than ever before, and coordinate the firing of Nike Hercules and Hawk missiles. With their solid-state circuitry, the Mentors cost only 1/10 as much as the tube-circuitry systems they replaced, and can be operated and maintained by 50 men instead of 200.

Hughes has completed ground terminals for the Defense Communications Agency's satellite network in Hawaii, the Philippines, Southeast Asia, Ethiopia, West Germany, and Fort Monmouth, N.J. These ground stations, linked by 15 satellites dispersed in random 21,000-mile orbits around the equator, comprise the first military satellite communications network and insure uninterrupted two-way radio between U.S. forces anywhere in the world.

The traveling-wave tube aboard Mariner IV is still working, long after completion of the Mars mission. Now in orbit around the sun, Mariner IV continues to send back information on the solar environment. As of March 1, the miniaturized metal-ceramic tube built by Hughes had operated more than 19,000 hours. Similar Hughes tubes have also been used on Surveyor I, Early Bird, Syncom I and II, and Lunar Orbiters I, II and III, and are now in use on the current ATS and Intelsat satellite series.

Full-color photos of the Atlantic cloud cover will be taken by a new camera being developed by Santa Barbara Research Center for NASA's ATS-C satellite, scheduled for launch in December. SBRC, a Hughes subsidiary, also built the camera that is sending back black-and-white photos of the earth's cloud cover from ATS-1, now in geostationary orbit over the Pacific. New color camera will transmit simultaneous blue, green, and red video channels, from which full-color photos will be made.

A computer that "learns" in much the same way an animal does has been built by Hughes as part of a long-range research program in artificial intelligence. It has already learned to recognize letters and numerals and to differentiate between sounds. Its ability to search photographs for structures of a particular kind, now being applied under a NASA contract, may lead to an automatic method of classifying the visual appearance of other planets.

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