# news and reports

## Space, Motion Pictures and Television — Embraced

TIROS I, a drum-shaped object 42 in. in diameter and 19 in. in depth, went into orbit April 1 and is now hurtling around the Earth, 400 miles "up there." A radio announcement that the weather-observing satellite had been launched from Cape Canaveral and had gone into orbit came about 6:30 A.M. (EST); about six hours later a 14-min sound film showing the orbiting satellite gave the American public an awe-inspiring view of its launching and a clear view of cloud formations as seen by Tiros's "eye." (The project was named Television Infrared Operation Satellite — hence, Tiros.) The remarkable delivery schedule of this film, a production of Reid H. Ray Film Industries, Inc., was the result of exacting preparation and precise timing.

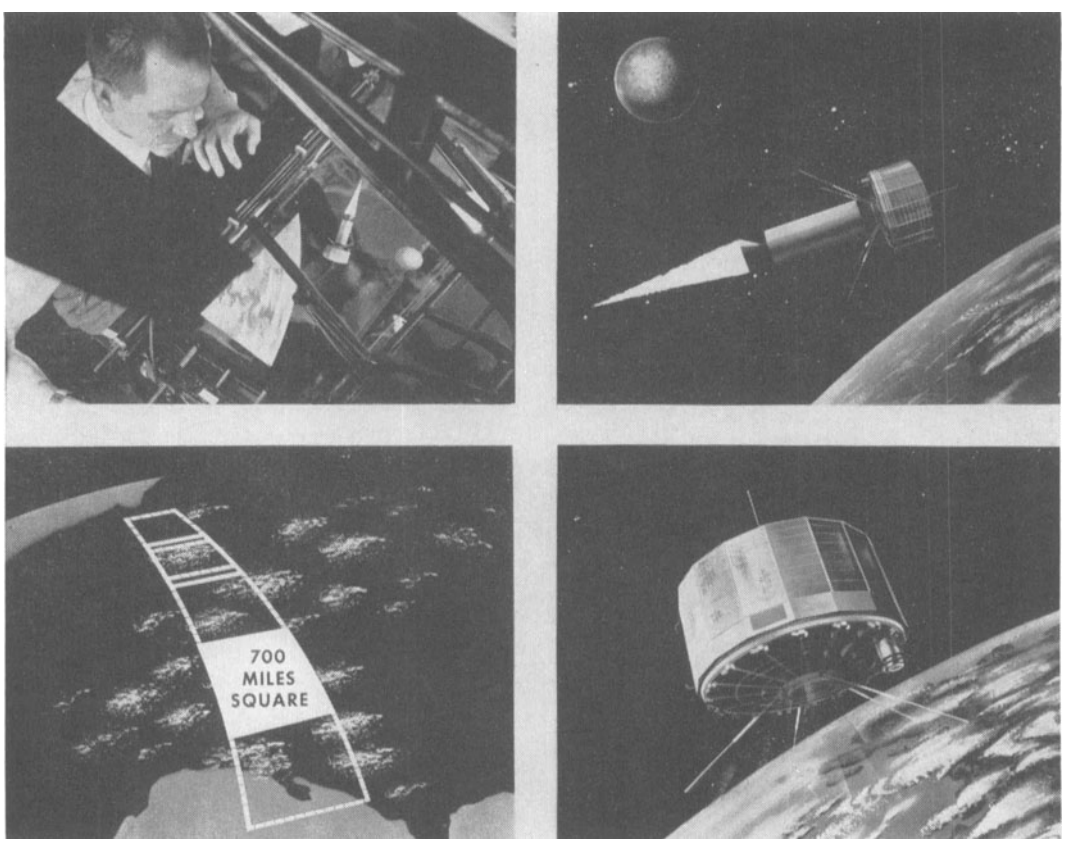
Putting the film before the satellite better tells the story at this stage: Last November script writer Robert Bruce of the Reid Ray Organization was indoctrinated in the classified project TIROS at the Princeton, N.J., laboratories of the Asto-Electronics Products Division of Radio Corporation of America, the sponsor of the film. At the same time, Gordon Ray, Animation Director, began planning the animated sequences.

By December it was decided to produce the film in 35mm Eastman color, and a very careful production schedule was established because of the importance of releasing the picture simultaneously with the launch date. Reid Ray, Director of the picture, and his camera and electrical crews spent eight days on location early in December at Princeton. They photographed the various components of Tiros and several assembly stages under actual test conditions. Sounds of the weather satellite in orbit were simulated by the RCA ground station and recorded. Each day's exposed film was rushed to Movielab in New York which developed the color negative and rushed prints back for projection the next day in a theater in Hightstown, N.J. Careful screening of the rushes was necessary: the film was to be released for 35mm wide-screen theater exhibition, TV broadcast and 16mm. The composition of each scene had to be compatible to all three screen ratios.

The film, itself, and the story of its production reflect in a way the concentration of the many kinds of talent, training, skill, immense resources and exacting labors brought together for one purpose — man's tossing into space a strange and special speck for the purpose of adding to the sum total of human knowledge.

The satellite, strictly speaking, is only one component — the information-gathering element — in a complex satellite and ground system developed by the Radio Corp. of America. It was directed into orbit by the Bell Telephone Laboratories Command Guidance System.

Miniature television cameras, video-tape recorders and transmitters within the satellite maintain constant contact with a ground network of tracking and receiving stations, data processing systems and programing and control centers. Tiros encloses two complete television systems capable of taking a series of still pictures of cloud formations during each orbit. Each employs a specially developed RCA $\frac{1}{2}$-in. vidicon camera (small enough to hold in the palm of a hand). One of




**Upper left: Animation for Tiros film was completed months before launching.**

**Upper right: Tiros—propelled into space by third stage of Thor-Able rocket.**

**Lower left: Tiros TV cameras record cloud formations blanketing the Earth.**

**Lower right: Artist's conception of the 42-in. Tiros making its 90-min. trip around the Earth at a 400-mi. altitude.**

the cameras is equipped with a wide-angle lens for viewing clouds in an area about 800 miles on each side; the other employs a narrow-angle lens to scan cloud details in a smaller area. A miniature television magnetic tape recorder, designed for satellite use, is linked to each camera.

At the start of each orbit, the cameras can be electronically instructed to photograph a specified area — such as a typhoon center over the Pacific, or a hurricane in mid-Atlantic. The instructions, prepared at the NASA Computing Center in Washington in cooperation with the Weather Bureau, are sent to the ground stations. At the appropriate station, the program is sent in the form of radio signals to an "electronic clock" inside Tiros. The clock stores the instructions somewhat in the fashion of a remotely operated alarm clock, causing the cameras to start a sequence of operations at the specified time during the succeeding orbit as the satellite passes over the region of particular interest. As the satellite swings around the Earth and comes again within range of a ground station, a command signal is sent from the ground for transmission of the cloud pictures stored on the tape. At the ground station, the information is displayed on a television picture tube and recorded on another magnetic-tape system. The image on the picture tube also is photographed and stored for future reference by meteorologists.

The purpose of the Tiros system has been defined by Barton Kreuzer, Manager of Marketing for RCA Astro-Electronics Products Division, as "visual observation of cloud formations over large parts of the Earth to produce new information about such weather phenomena as hurricanes, typhoons, and the movement of weather fronts." And Sidney Sternberg, the Division's Chief Engineer, described the satellite as "a major space system complex incorporating advanced concepts in space communications and the remote control of satellite functions."

The radio-inertial command guidance for Tiros is the same system as that developed by Bell Telephone Laboratories and Western Electric Co. for the Air Force Ballistic Missile Division for use in the first squadrons of the Titan intercontinental ballistic missile.

It is interesting to note that only a week before Tiros was launched, a paper presented at the International Convention of the IRE in New York called attention to the "billions lost each year in storm damage" in the United States, and warned of grave consequences if weather research were neglected.

Admiral Luis de Florez, consulting engineer and former Assistant Chief of Naval Research, in addressing a Symposium on "Electronics — Out of the World," called for more manpower and more funds to be devoted to vital research in weather forecasting and control. "Actually, it would be of greater immediate importance to this country to be the first to find the answer to the feasibility and practicability of weather control than to land a man on the Moon," he said.

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INTERNATIONAL CONGRESS 1960 5TH SMPTE ON HIGH-SPEED PHOTOGRAPHY

**Warren Magnuson,** Chairman of the Senate Committee on Interstate and Foreign Commerce, author of S. Con. Res. 75 (*Journal*, Sept. 1959, p. 638; and Oct. 1959, p. 706) has been a strong defender of research and scientific endeavor during his active political career extending over almost three decades. He was elected to the Washington State House of Representatives in 1932; in 1937 he became a member of the U.S. House of Representatives and in 1944 he was elected to the Senate.

Among the many evidences of his interest in science is his sponsorship of legislation to create the National Science Foundation, and he is presently directing efforts toward broadening the scope of its research program. He is sponsor of legislation to get the Navy's Tenoc program in Oceanographic Research funded and underway. The Senate Resolution, referred to above, expresses Senator Magnuson's sincere interest in scientific advancement in general and recognition of the importance of the 5th High-Speed Congress in particular. The Resolution calls for active participation by Federal agencies and was passed unanimously by the Senate.

## Education, Industry News

**Rapid processing of film** is the subject of a symposium of the Society of Photographic Scientists and Engineers will be held in Washington, D.C., October 14–15. It is planned in conjunction with the Fifth International Congress on High-Speed Photography, October 16-22. SPSE Papers Chairman is Fordyce M. Brown, c/o Photomechanisms, Inc., 6 West 18 St., Huntington Station, N. Y. The emphasis will be on compact, simplified photoprocessing equipment with short process time. Primary interest will be in the special techniques associated with development and design, specialized photographic chemistry, and specific uses in science, industry and the military. Depending on time available, reports on design and construction of larger processing machines and on advances in processing methods and control systems may also be scheduled. An introductory paper, "The Revolution in Photographic Processing," will be presented by George Eaton, SPSE President. A technical exhibit of equipment related to reports presented at the Symposium is being arranged.

**The Society of Photographic Scientists and Engineers** will hold its 1960 National Conference May 9–13, at the Miramar Hotel, Santa Monica, Calif. More than 60 technical papers are scheduled, among them reports on space photography and related instrumentation. A session on photographic engineering will include papers on a new technique for high-speed photography of cyclic events, use of magnesium-filled lamps in high-speed photography, and details of photographic support of research on jet engines. Photographic sessions on processing and apparatus will