



DR. ROBERT A. FROSCH, NASA's new Administrator, (left) is briefed by Dr. Carl Fichtel. Dr. Robert S. Cooper, Goddard Director, looks on.

## Frosch Visits Goddard

Dr. Robert A. Frosch, newly appointed NASA Administrator, visited Goddard recently to be briefed on Center programs by Goddard Director Dr. Robert Cooper and several key personnel.

Dr. Frosch was confirmed June 16 as the agency's new Administrator by the U.S. Senate.

Dr. Frosch, prior to his new appointment, was Associate Director for Applied Oceanography at the Woods Hole Oceanographic Institution on Cape Cod, Mass., a position he had held since 1975.

From 1973 to 1975, Dr. Frosch was Assistant Executive Director of the United Nations Environment Programme, holding the rank of Assistant Secretary General of the United Nations. Previously, from 1966 to 1973, he was Assistant Secretary of the Navy for Research and Development. In earlier years, he served in various posts involving government research and development projects.

Dr. Frosch's professional career began in 1951 with the Hudson Laboratories of Columbia University, where he worked on Naval research projects. There he progressed from Research Scientist to Director of the Laboratories, becoming Director in 1956 and remaining in that post until 1963.

A native New Yorker, Dr. Frosch earned his A.B., A.M. and Ph.D. degrees at Columbia University. He is a member of Phi Beta Kappa and Sigma Xi. He received the Arthur S. Flemming Award in 1966 and the Navy Distinguished Public Service Award in 1960. Dr. Frosch is a member of some nine scientific professional societies and the author of numerous scientific publications. He is a member of the National Academy of Engineering.

## First Japanese Weather Satellite Launched

Goddard's Delta 2914 launched the Japanese Government's first meteorological satellite into synchronous orbit from Cape Canaveral, Fla., on July 14, 1977.

The Geosynchronous Meteorological Satellite (GMS) weighs 620 pounds and represents a major scientific attempt to improve weather predictions over millions of square miles in the Western Pacific Ocean.

GMS is a satellite program under the direction of the National Space Development Agency of Japan (NASDA). The Delta launch vehicle project is managed for NASA's Office of Space Flight by the Goddard Space Flight Center, Greenbelt, Md.

After GMS went into its preliminary orbit from Cape Canaveral, all control and monitoring functions were performed from the GMS Mission Control Center at Hughes Aircraft Company, El Segundo, Calif.

The cylindrically-shaped weather satellite is the first of several "weather watchers" to be launched by several countries in an attempt to improve weather predictions for extended periods on a global basis. This international weather satellite program is a major part of the Global Atmospheric Research Project (GARP). GARP is sponsored by the International Council of Scientific Unions and the World Meteorological Organization.

Others contributing weather satellites to the GARP Program include the European Space Agency (ESA), the Soviet Union and the U.S.

Members of the European Space Agency are Belgium, Denmark, France, Italy, Netherlands, Spain, Sweden, Switzerland, West Germany, the United Kingdom and Ireland.

Under the GARP Program, five geostationary meteorological satellites (two from the U.S., one each from Japan, the Soviet Union and the European Space Agency) will be placed in orbit. Additionally, the U.S. and the Soviet Union plan to launch two satellites each into polar orbit.

The mission of these satellites is to:

- Collect and disseminate observation data on cloud formations and Earth surface temperatures.
- Collect and disseminate meteorological observations data from ships, buoys and unmanned observatories.
- Observe solar protons by space environment monitor.

In addition to those countries participating in the satellite portion of GARP, approximately 145 countries also will make contributions to the world-wide weather effort by taking daily surface and atmospheric measurements in their respective areas.

All of the data will be sent to Central Data Centers in Moscow and Washington, D.C. Current planning calls for the program to be in full operation by December of 1978.

GMS has been designed, developed and manufactured by Hughes Aircraft Co. under subcontract to the Nippon Electric Co., Ltd. of Japan. Hughes also developed the satellite's camera system. The GMS was designed and built by Nippon Electric Co. Prime contractor for the Delta launch vehicle is McDonnell Douglas Astronautics Co., Huntington Beach, Calif.

The U.S. is reimbursed by the Japanese Government for costs associated with providing Delta launch support.

## Goddard Gets New Mission Search and Rescue

Since 1974, Congress has required the installation of emergency locator transmitters (ELTs) on general aviation aircraft, and the U.S. Coast Guard in 1975 required the installation of emergency position indicating radio beacons (EPIRBs) on ocean going vessels. Today, approximately 150,000 aircraft have been equipped with ELTs and 1900 ships are equipped with EPIRBs. The ELTs and EPIRBs have identical radio characteristics for search aircraft to "home in" on and operate on the international distress frequency of 121.5 MHz as well as 243 MHz, the military distress frequency. The EPIRB is designed to go off automatically by crash activation. At the present time, the "home in" range is within 30 miles of the crash site, usually achieved by flying criss-cross patterns involving many planes and costly and sometimes risky flying hours.

NASA, with the support of the FAA, the U.S. Coast Guard, Department of Commerce, Federal Communications Commission, and the U.S. Air Force, has proposed a satellite system to aid search and rescue efforts. The proposed satellite system called "Search and Rescue Orbiting System" is envisioned to consist of an instrument package to be carried by NASA/NOAA and USAF operational meteorological satellites.

The NASA satellite effort will be implemented by the TIROS Project Manager Gil Branchflower with Bernie Trudell as the Mission Manager. The Search and Rescue Mission is the result of studies conducted by Dr. Bill Redisch's Communications and Navigation Division of the Applications Directorate. The satellite system would make it possible to determine the site of plane crashes and shipwrecks more precisely to an accuracy of a few kilometers. Additionally, by using newly designed transmitters, it would also be possible to receive coded data about the nature of an accident, such as whether a vessel was on fire or sinking. NASA has received congressional approval for \$5.6 million in FY-78 for the new satellite system which will be included as part



DR. JAMES BROWN (left) and Howard Estep stand next to a mock-up antenna for the S&R system behind Building 19.

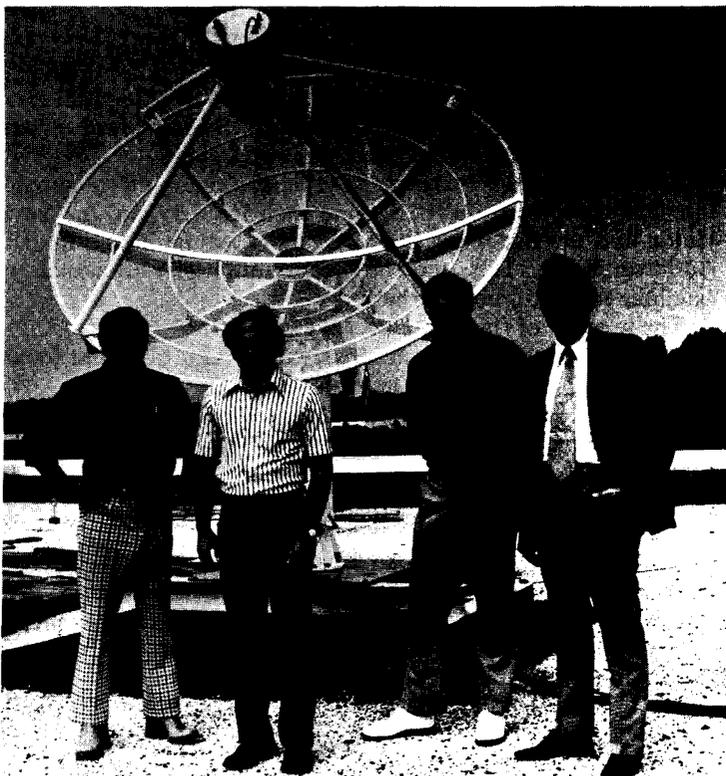
of the instrumentation flown on several of the forthcoming TIROS-N weather observation satellites in a joint program with Canada.

The spacecraft will fly in near-polar orbit at an altitude of about 450 nautical miles above the earth and provide a ground coverage swath over 2000 nautical miles wide. If the system becomes operational, a four-satellite system would insure detection of a crash over land within two hours and over water within four hours after the radio beacon turned on.

Within minutes after the satellite had received a distress signal a position fix of the distress site to within five to ten miles (one to three miles with the new transmitters) would be computed by a local user terminal (LUT) receiving the signal relayed by satellite. This information would then be sent to the nearest rescue coordination center where search and rescue (SAR) forces would be alerted and deployed. These SAR forces would then use the same emergency transmitting signal for final location of the distress site.

The concept proposed consists of using the satellite to relay the distress frequency signal of the current ELTs and EPIRBs as well as the new transmitters operating at 406 MHz. These signals would be received at the LUT which, in conjunction with knowing precisely where the satellite position is with time, detects and processes the doppler information to determine position location with the aid of a sophisticated mini-computer. (Doppler effect has been observed by anyone who has ever stood at a railway crossing while a high speed train approaches with its whistle bellowing. The whistle frequency or pitch appears to increase as the train approaches and decrease as the train passes.)

NASA's experience from previous missions, such as the Nimbus-6 Doppler tracking of buoys and meteorological balloons, has demonstrated feasibility of the basic concept which will now be applied to distress situations. The system which will be implemented for search and rescue is an outstanding example of NASA technology being applied to meet specific civilian needs. It is only one of a number of on-going studies being conducted under the general heading of "data collection" by Chuck Cote's Communications and Navigation Applications Branch.



STANDING BEFORE the LUT antenna for meteorology are (from left) Chuck Vermillion, Head, Direct Readout Applications; Phil Ashcraft, Project Engineer, Direct Readout Applications; Paul Wren, S&R Ground Systems Manager; and Paul Schmid, Head, Measurements Evaluation Branch.

## A & M Awards Ceremony

The following were recipients of the A&M Gold Star Award and a \$100 bond:

	Code
Ronald Lassiter	210
Wilma Chigas	220
Betty Pettus	220
Rose M. Marino	230
Georgina C. Obenschain	230
James E. Edwards	250
Rita M. Mills	250
Pamela Bolling	260
Donald R. Sampson	270
Edward Fortman	290
Thomas H. Mooney	290

## Delta Launch Schedule

The revised Delta launch schedule through the remainder of this year is:

- OTS/ESA (European Space Agency Communications Satellite) Sept. 13
- ISEE/A/B (International Sun-Earth Explorer) Oct. 13
- Meteosat/ESA (European Space Agency Meteorological Satellite) Nov. 13
- CS (Japanese Communications Satellite) Dec. 1

# GOES Successfully Launched

A new environmental monitoring satellite, positioned to keep watch over the eastern half of the United States and the Atlantic Ocean, was launched by NASA June 16 at 6:51 a.m. EDT just in time for this year's hurricane season.

The satellite, GOES-2, is the latest in a series of Geostationary Operational Environmental Satellites to be operated by the National Oceanic and Atmospheric Administration (NOAA). The spacecraft was placed into an Earth synchronous orbit at an altitude of about 22,300 miles (35,800 kilometers) with a velocity which will keep it in position over the equator above South America.

From the position, instruments aboard the satellite will let it "see" the development of hurricanes in the tropical Atlantic or Caribbean, and follow any storm's movement. The satellite routinely transmits imagery back to earth every half hour, day and night; more frequently when necessary.

GOES-2 will replace an earlier spacecraft of the same series in maintaining the East Coast and Gulf watch. Another satellite of the series is positioned above the equator over the Pacific Ocean, watching the western half of the United States and the Pacific as far west as Hawaii.



**READY—GO!** The participants in the Third NASA Inter-Center Postal Jogging Competition get off to a good start on the first leg of the 16 lap four-mile run held at Eleanor Roosevelt High School track. Above, (from left) Jim Darraugh (2nd place, 24:59), Al Greenberg (1st place, 23:28), Donna McDuffie and John Paul (3rd place, 25:24) confer over race results.

## Goddard Mourns . . .

Ray Allen passed away on July 3. He had been employed at Goddard since October 1962. During all this period he was assigned to the Data Processing Branch, initially in an engineering capacity and starting in April 1975 as a quality assurance analyst.

Mr. Allen worked on many different satellite projects. At the time of his passing he was actively involved in the AE and ISEE projects.

Prior to his employment at Goddard Mr. Allen was employed at the Aberdeen Proving Grounds as an electronic engineer.

Mr. Allen was 53 years old.

**ROSS COVINGTON**, Head, Compatibility Test Section, Code 862, recently served as Music Director of the Alaska Simultaneous Evangelistic Crusade.

Ross has served in Satellite Tracking Station Management at Mohave (California), Tananarive (Madagascar), and Fairbanks (Alaska) for seven years before his assignment to GSFC's Compatibility Test Section.

Ross has worked in the music ministry in most every area of service in the U.S. and Madagascar. He serves on the Baptist Convention of Maryland's State Mission Board; conference, retreat, and camping committee, and policies and procedures subcommittee; Prince George's Baptist Association's Executive Committee as Chairman of Evangelism; and has served in numerous positions in local congregations.

Ross was a candidate for the Bowie State Council and may throw his hat in the ring again this year.



## Moon Tree Planted

BARBARA SCOTT, Code 734, plants a sycamore tree at the Goddard Visitor Center during a special ceremony June 9. Center Director Dr. Robert S. Cooper (far right), A&M Director William Mecca (center) and a group of visitors look on.

The tree was grown from a collection of seeds carried to the Moon by Astronaut Stuart Roosa on Apollo 14 in a study of prolonged weightlessness on seed germination and growth. At last report the tree was doing fine.



## Education Activities Praised

The Educational Programs Office was complimented recently for activities in New York City and Prince George's County, Maryland. It is part of the Office of Public Affairs.

A delegation of school officials from New York City District # 6 flew to Goddard on May 27, 1977 to present a plaque to the Center for "Distinguished Contributions, Magna Cum Laude, to the Children of District 6." This was in recognition of the many activities that occurred in District 6 during a Community Involvement Program last December.

There were a number of TV tapes done in Teleprompter Cable TV studios including an award-winning cablecast "Salute to Viking" which was aired on Teleprompter's Channel 10. It later received a National Cable Television Association Award, the "Emmy" of that industry, as "best educational special for cable programming in the country."

In addition, assembly programs on space were conducted for 16,000 students in all schools of the district; Aerospace Work-

shops were conducted for 400 teachers and the special "Salute to Viking" was transmitted from GSFC to Teleprompter studios via the Communications Technology Satellite and from Teleprompter to 100,000 homes in District 6.

On June 6, Elva Bailey, Goddard's Educational Programs Officer, received a special award at the Annual Recognition Dinner given by the Board of Education of Prince Georges County.

Called "Citation of the Year for Outstanding Community Service" it was awarded for the first time to a citizen outside the school system, in recognition of "outstanding contributions to the school system."

Under Mr. Bailey's direction, Goddard's Education Office, as well as numerous Center volunteers, have worked with Prince Georges County Educators in numerous ways. These include:

- Placing special education students from five nearby high schools in vocational training programs at GSFC.
- Placing college-bound secondary school students in their tentative career-choice fields under the guidance of Goddard professionals.
- Conducting summer workshops for teachers on site.
- Arranging consultation sessions for individual students with Goddard professionals.
- Working with secondary school students on exhibit materials for the GSFC Visitor Center during the Bicentennial year.

In addition, Mr. Bailey, in cooperation with the Maryland State Department of Education, created a series of 40 one-minute TV programs on Maryland "firsts" in science and technology which were broadcast on educational and commercial TV in the state. He received a commendation for the effort from the Maryland Bicentennial Commission.

GODDARD NEWS is published by the Office of Public Affairs at the Goddard Space Flight Center. Mail Code 202, National Aeronautics and Space Administration, Greenbelt, Maryland 20771.

Edited by PAO Staff  
Patricia Ratkewicz, Secretary, Phone Extension 4955