GSFC

GODDARD NEWS

GODDARD SPACE FLIGHT CENTER / GREENBELT, MARYLAND

VOLUME II, NUMBER 7 THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MARCH 16, 1962

OSO — THE FIRST SUCCESS OF THE 'SECOND GENERATION' OBSERVATORIES

Goddard's complexed Orbiting Solar Observatory (OSO) was boosted into a 350-mile-high orbit by a Delta rocket from Cape Canaveral, Florida on March 7 opening a new phase in the nation's space program. This was the seventh straight successful launching by the three-stage vehicle under management of Goddard's Spacecraft Technology Division.

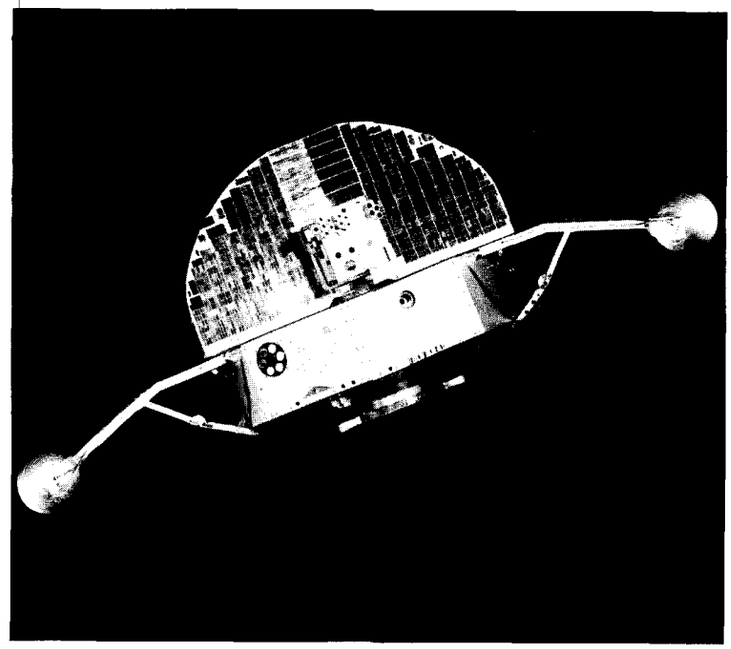
The first of the large "second-generation" observatories the 458-pound spacecraft is permitting astronomers for the first time to measure solar radiations which the earth's atmosphere has blurred from their instruments throughout history.

Immediately after injection into orbit, OSO's instruments began sending back data on radiations in the ultra violet spectra. Dust particles in space, solar neutrons, and electrons and protons in the earth's radiation belt are also being recorded.

An editorial that appeared in the Miami Herald said: "If it works as the technicians expect, we will learn some of the deepest mysteries of the sun that governs all life, and we will have taken a long step toward a landfall on the moon in five years.

NASA Deputy Administrator Dr. Hugh Dryden, called the satellite "In many respects the most advanced satellite ever launched."

"With OSO," Dr. Dryden said, "we are beginning to probe deeply into the basic forces that determine the kind of planet we live on. . . . As we learn more about the earth and how it is affected by solar radiation."



The spacecraft has two sections. The base of the craft is a 44-inch diameter octagonal wheel designed to spin for stabilization. It is crammed with sky-mapping experiments to compare radiation from the sun with that in other areas of space. Extending from the base are three arms. At the end of each is a ball of pressurized nitrogen gas, which squirted out to keep the wheel spinning.

Atop the rotating wheel on a separate fixed axis was a fan-shaped structure whose instruments were to point constantly at the sun during daylight hours.

Project manager and project scientist is Dr. John C. Lindsay, Space Sciences Division. Project coordinator is George R. Smith, Space Sciences Division.

There are thirteen scientific experiments on board OSO. The experiments and experimenters involved are the following:

• Solar X-ray Experiment (10 to 400 Angstroms) (X-ray Spectrometer) by Goddard's experimenters Dr. William Behring and Dr. Werner M. Neupert.

• 0.510 Mex Gamma-Ray Monitoring Experiment by GSFC's Kenneth Frost and William White.

(See OSO, Page 4)

INITIATING EFFECTIVE PROCUREMENT ACTIONS

On March 1, all GSFC personnel planning to initiate a request for procurement action started using new forms (GSFC No. 18-27) thus bringing to an end the era of the well-known "stub." The new Procurement Request ("PR") is the result of an extensive study involving many GSFC personnel throughout the Center and is designed specifically to suit Goddard's needs.

In advance of its introduction, during the latter part of February, six special orientation lectures were conducted for personnel having an active interest in preparation and approval of Procurement Request. More than 500 employees attended these sessions which included not only instructions on preparation of the new forms, but also explanations of the need for information and advice on the time to be allowed for placing contracts.

During the lectures Eugene W. Wasielewski, Associate Director, pointed out the importance of the new forms and procedure as part of Goddard's growth into a major contracting agency supporting an overall Goddard budget exceeding $320 million in Fiscal Year 1963. He also stressed the need for this action as a means for obtaining better procurement action more rapidly, without the wasted time of waiting for addiitonal information which could have been furnished earlier. Other speakers included Dr. John W. Townsend, Jr., Assistant Director for Space Science & Satellite Application; Leopold Winkler, Office of Technical Services; John T. Mengel, Assistant Director for Tracking & Data Systems; Mrs. Alberta Moran, Office of the Director; Dominick Cinciripini, Management Service Division and key personnel of the Procurement and Supply Division.

The new Procurement Request Forms are available at the Mail and File Section of Management Services Division, Room W-201, Building 5. For additional copies of the Handbook or for further questions or suggestions contact Dominick Cinciripini, Ext. 5021.

The initial "PR" design will be closely analyzed during the first six months and, if necessary, any revisions will be incorporated. Because of the possibility of printing a revised "PR", all users are requested to draw conservative supplies during the initial trial period.

March 16, 1961 . . . A YEAR OF PROGRESS —

Message from the Director

On March 16, 1926, a small rocket propelled with liquid fuel rose from its launch in a Massachusetts field and soared 184 feet into the air. Although the significance of the event went unrecognized by most of the world, an American scientist, Dr. Robert H. Goddard, had opened the doors to a new age in the history of mankind.

One year ago, on the anniversary of the historic event, this Space Flight Center was dedicated in tribute to Dr. Goddard's unselfish contributions to science, technology, and his unceasing efforts, as a true scientist, to bring a dream to a reality.

The year that has passed since our Center was dedicated has been a year of steady progress, and achievements, and I would like to take this occasion to thank every one of you for your efforts which have brought about the accomplishments of the Goddard team. Our many contributions to the NASA mission have been significant.

To recall but a few, the P-14, Explorer X—"an all Goddard satellite"—was successfully orbited shortly after the Center was dedicated; another scientific spacecraft, Explorer XII, sent back more data than all previously launched earth satellites; two more Tiros meteorological satellites were sent into orbit; the Delta launch vehicle marked the seventh consecutive successful satellite launching in its history of eight attempts; and a new era of space research was opened with the first of our second-generation satellites when the Orbiting Solar Observatory was launched very recently. The tracking and communications network and real-time computer operations for manned space flight were brought to operational status and functioned excellently for the flight of Col. Glenn.

In addition our sounding rocket program has been vigorous and fruitful. We launched seventy of these vehicles in 1961. This year, the program calls for more than twice that number.

We can review the past year with much pride. The present and future missions and the years ahead promise to be more exciting.

We soon will launch the first of the satellites in NASA's international program; active "repeater" satellites will be orbited to develop a new system for world-wide communications; and before this time next year, we hope to launch the first second-generation weather satellite, the Nimbus to provide global weather observation.

We have been given great responsibilities as a member of the NASA team. I look forward, with you, to greater challenges in our new age and the gratification derived in directly contributing to man's first scientific steps into the vast world of space exploration—a world that holds great hope and benefits for all of us.

Harry J. Goett
Director

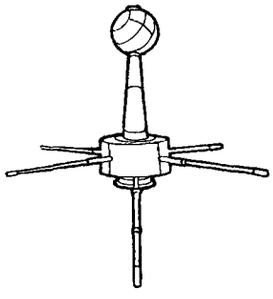
At the Goddard Space Flight Center of the National Aeronautics and Space Administration, the exploration of space is about a $1,000,000 a-day business.

The Center is currently responsible for 61 major space projects. Of these 34 are scientific satellites, 27 are application (weather and communication) satellites. All are complex examples of modern science and technology.

Goddard's present program is estimated to call for an investment of more than $300,000,000 during the next twelve months. About 80% of these funds will go to private industrial contractors and scientific research orginizations.

Since its formal dedication a year ago, the Goddard staff has expanded from 1,300 to about 2,100 scientists, engineers, technicians and support personnel. The large majority of these are scientific and technical experts directly engaged in space projects.

Under special scientific grants, the Goddard staff includes many foreign scientists and other specialists. Represented are the following foreign countries: India, Australia, Great Britain, Norway, Italy, Pakistan, New Zealand, Japan, Switzerland, Iran, Nationalist China, West Germany, Israel, Turkey, Canada, Korea, etc.



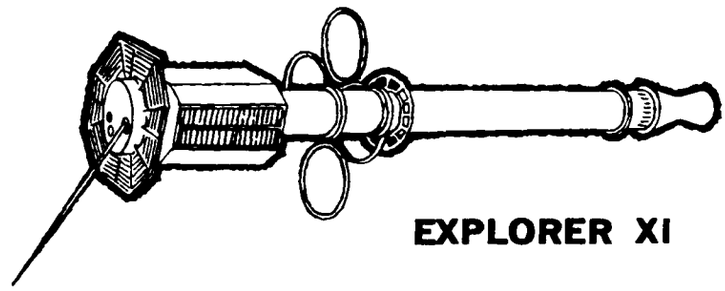
EXPLORER X

The Center's announcement of this large-scale space science effort coincides with the 36th anniversary (March 16) of the world's first flight of a liquid-propelled rocket engine by Dr. Robert H. Goddard, father of American rocketry, for whom the Center is named.

What a few years ago was a 550 acre track of Maryland farmland is now a cluster of modern functional buildings, housing men and equipment engaged in the search for knowledge about the world of outer space.

A year ago only four buildings were completed, containing a total of some 280,000 square feet.

As the Center observes the first anniversary of its dedication, seven buildings have been completed and occupied. The available space has almost doubled. Seven additional buildings are under design or construction. When completed, these will again double Goddard's space.



EXPLORER XI

Since the Goddard organization was created, many of its offices were scattered throughout the greater Washington area. Its early headquarters were housed at the Anacostia Naval Training Station.

This week, Goddard officials report that all personnel from the Anacostia base have been moved to the Greenbelt site. According to one harassed member of the new space team, "we have finally matriculated from Anacostia to the Goddard Space Flight Center."

Goddard's highly specialized optical facility which was located at the Naval Weapons Plant in downtown Washington will also soon move to new quarters at the Space Center. It manufactures precision optical equipment for space experiments.

During the past three months as office and laboratory space became available, some 800 people were moved to new locations.

To keep track of new offices and of newcomers to the Goddard staff, a temporary telephone directory is issued about every week, no simple task for a small "community" of over 2,100.

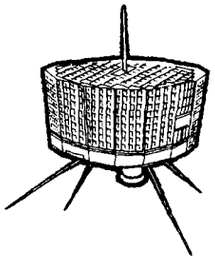
However, office space is still at a premium. Building #5 housing the fabrication shop eventually slated to serve for the assembly of large spacecraft, now serves as temporary office space.

Offices still outside the Greenbelt compound include the Contract Staff, Supply and Procurement Division, located in Bladensburg, Md. and Tracking and Data personnel with offices at Litton Industries, College Park, Md.

In May of last year Goddard's Institute for Space Studies was established in New York City. Under the direction of Dr. Robert Jastrow, the Institute conducts theoretrical research in the space sciences. It works in close cooperation with the universities in the New York metropolitan area. Its program involves all areas of basic theoretical research, including broad segments of physics, astronomy and the earth sciences.

Major current activities include studies of the stellar structure and evolution, formation of the stars and the origin of the solar

A YEAR OF ACHIEVEMENT . . . March 16, 1962



TIROS III & IV

system. Also atmospheric physics and theoretrical meterology.

It has a staff of fifty, including twenty scientists at the PHD level.

The Institute's activities include two-way exchange studies with faculty members of cooperating universities. It also assists in student studies by supervising the preparation of research papers.

Its offices are located at 475 Riverside Drive, New York City.

Since the Center was formally dedicated, its scientists and their projects have contributed to a great out-pouring of information. Here is a partial list of accomplishments.

Explorer X, launched March 25, 1961. Transmitters functioned continuously for 60 hours. Data supported theory that interplanetary magnetic field near earth is mainly an extension of the sun's magnetic field.

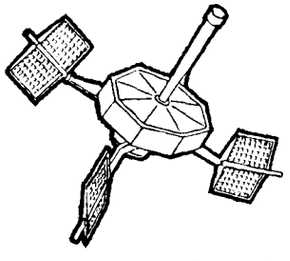
Explorer XI launched April 27, 1961, to detect high-energy gamma rays.

Tiros III and IV, launched July 12, 1961 and February 8, 1962 respectively. Weather satellites which successfully photographed and televised the earth's cloud cover and measured infrared data of the earth; heat balance radiated into space.

Explorer XII, launched August 15, 1961, ceased transmitting December 6, 1961 after sending 1.6 billion items of data. Preliminary analysis of 10% of this data indicates that Van Allen belts are one zone of charged particles trapped in the earth's magnetic field, extending from 400 to 30,000 or 40,000 miles out. Explorer XII went out some 50,000 miles.

"Scout", the P-21 probe, launched October 19, 1961 confirmed earlier findings of a helium layer in upper atmosphere and further information on structure of the ionosphere. Studies such as these are important to long distance radio communications.

Also during the past year, Goddard's Mercury network was accepted from the team of cooperating contractors. Throughout the year this world-wide network helped to write the nation's space



EXPLORER XII

history, none more dramatically than the three orbit flight of astronaut John H. Glenn in his Freedom 7 capsule. The network was "A-OK" all the way.

It is the world's largest integrated network manned by some 1,500 technicians and scientists. It comprises some 100,000 miles of teletype circuits, 35,000 miles for voice communications and a 5,000 mile circuit for high speed "real time" computers. Dual ultra-high speed 7090 IBM computers one of the fastest systems in the world, each with a "real time" channel, make constant flight contingency recommendations, predict flight path, impact point of the capsule as well as velocity vectors on a near-instantaneous continuous basis during the mission. These computers, in the simplest mathematical explanation, can add, for instance, a column of 10-digit numbers ¾ of a mile in length every second.

The system is under constant refinement and is expected to be used in connection with the Apollo-man-to-the-moon project.

In recent months two new stations were added to the Minitrack net which provides for the tracking and telemetering of unmanned NASA spacecraft in the cis-lunar regions.

A wide-band data acquisition network is also being added to this net to provide for multiple band width communications. With new satellites, each carrying numerous scientific experiments soon to "inhabit" outer space, a wide band network is needed capable of transmitting the vast amount of information to be recorded hundreds or thousands of miles away.

The first wide band station to be operational is at Gilmore Creek, some 20 miles from Fairbanks, Alaska. It has a huge 85 foot parabolic antenna. A similar station is also being constructed at Rosman, North Carolina.

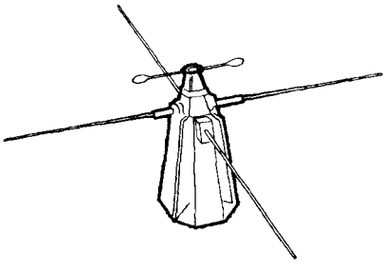
The Gilmore station is expected to get its first work-out in connection with the Nimbus weather satellite, a Goddard project slated for launch later this year.

The North Carolina station is scheduled to be ready for OGO, Goddard's Orbiting Geophysical Observatory, scheduled for 1963.

In addition, some seventy sounding rockets were launched from Wallops Island, Virginia; Fort Churchill, Canada; and Woomera, Australia on short range flights to gather scientific information in space.

New projects being developed by Goddard's space scientists include a series of "second generation" satellites.

As compared to their "first generation" forerunners, which provided generally for a single experiment, these spacecraft will contain a complex array of scientific experiments. The first of these, the Orbiting Solar Observatory was launched on March 7th.



P-21

This satellite was placed in a near circular orbit about 300 nautical miles above the earth. It is probably the most complicated scientific satellite launched to date. One of its prime features is its ability to keep itself pointed at the sun and with the aid of some thirteen scientific instruments report on the sun's radiation spectrum, which except for a very narrow band is not visible from the ground.

Orbiting Geophysical Observatories and Orbiting Astronomical Observatories are additional major Goddard projects designed to explore the earth and galaxies from outer space. The first in this series are slated for launch during 1963.

Numerous communications and weather satellites are also slated for the coming months. This includes the Nimbus weather satellite which will differ from Tiros in two aspects. First, it will be oriented so that the television cameras will look down at the earth at all times. Second, it will be launched into a polar orbit, permitting its cameras to photograph the entire globe in each 24 hour period.

The first spacecraft under NASA's international program is the S-51 satellite, being prepared by the United Kingdom and the United States. The satellite, a Goddard project, is scheduled for launch early this spring. It will carry six British experiments in an integrated assault on the unknowns of the ionosphere reflective sky layer which begins some 40 miles out. The ionosphere filters out dangerous sun radiations while at the same time acting as a mirror to radio waves which makes long distance radio communications possible.

NOMINEES FOR GSFC PERFORMANCE RATING BOARD OF REVIEW . . .

The Employee Election Committee chairman, John C. New, Test and Evaluation Division recently announced that the following ten employees have been nominated by petition for election as the Employee Member of the GSFC Performance Rating Board of Review: Anthony Buige, Anthony DiBartolo, Jerald A. Everett, Jay Ralph Jett, Francis N. LeDoux, John C. Lyons, William H. Myer, Harold J. Peake, Milton Schach and Moe I. Schneebaum.

The official ballot will be over-printed on a payroll type IBM card which will be distributed with pay checks issued on March 23. Employees are to vote for only one candidate. The ballot must be signed and dated to be valid. Only ballots received by 12 Noon, Monday. April 2 will be counted.

ANTHONY BUIGE . . . works as an AST, Communication Control Techniques, in the Operations Branch, Operations and Support Division, Tracking and Data Systems. His Federal Service dates from his entrance on duty at Goddard on June 15, 1959.

ANTHONY DiBARTOLO . . . is employed as a Plumbing, Heating and Ventilating Lead Foreman in the Maintenance Section, Plant Engineering Branch, Facilities Engineering Division, Office of Technical Services. He transferred to Goddard on January 31, 1960, and has 15½ years Federal Service.

JERALD A. EVERETT . . . is a Purchasing Agent in the Purchase Section, Facilities and Support Branch, Procurement and Supply Division, Office of Administration. He transferred to Goddard on February 5, 1961, and has 4½ years Federal Service.

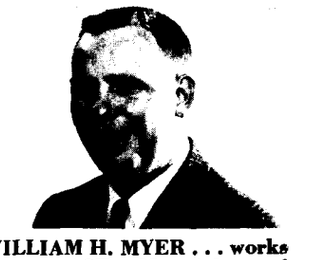
JAY RALPH JETT . . . is a Plant Maintenance Foreman in the Maintenance Section, Plant Engineering Branch, Facilities Engineering Division, Office of Technical Services. He has been with Goddard since August 1, 1960 and has 3½ years Federal Service.

FRANCIS N. LeDOUX . . . is head of the Assembly and Quality Control Section, Mechanical Systems Branch, Spacecraft Technology Division, Space Science and Satellite Applications. He transferred to Goddard on June 28, 1959 and has 21 years Federal Service.

HAROLD J. PEAKE . . . is head of the Flight R.F. Systems Branch, Spacecraft Technology Division, Space Science and Satellite Applications. He has been with Goddard since November 30, 1958 and has 20 years Federal Service.

JOHN C. LYONS . . . is head of the Modular Techniques Section, Systems Integration Branch, Spacecraft Technology Division, Space Science and Satellite Applications. His Federal Service dates from his entrance on duty at Goddard on July 5, 1960.

MILTON SCHACH . . . is head of the Thermal Systems Branch, Spacecraft Technology Division, Space Science and Satellite Applications. He transferred to Goddard on April 20, 1959. and has 20½ years Federal Service.



WILLIAM H. MYER . . . works as an AST, Materials and Structures, in the Office of the Chief, Test and Evaluation Division, Office of Technical Services. He has been with Goddard since June 8, 1959 and has 4 years Federal Service.

MOE I. SCHNEEBAUM . . . is head of the Systems Engineering Branch, Aeronomy and Metorology Division, Space Science and Satellite Applications. He transferred to Goddard on July 31, 1960 and has 18½ years Federal Service.

GODDARD NEWS

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OSO

(Continued from Page 1)

• 20 to 100 Kev X-ray Monitoring Experiment by William White and Kenneth Frost.

• 1 to 8 Angstrom X-ray Monitoring Experiment, by Goddard's experimenters Robert Young, William White, and Kenneth Frost.

• Dust Particle Experiment by GSFC's experimenters Merle Alexander and Curtis McCracken.

• Solar Radiation Experiment (3,800 to 4,800 Angstroms), by Dr. Kenneth L. Hallam, Harold Murphy, and William White, of Goddard.

• Solar Ultraviolet (1,100 to 1,250 Angstroms), GSFC experimenters Dr. Kenneth L. Hallam, Robert Young, and William White.

• Solar Gamma Rays Experiment (0.2 Mev to 1.5 Mev) (High Energy Distribution) by William White, Kenneth Frost, and Dr. Kenneth Hallam.

• Solar Gamma-Ray Experiment (50 Kev to 3 Mev) (Low Energy Distribution) by Dr. John R. Winkler and Dr. L. E. Peterson, University of Minnesota.

• Neutron Monitor Experiment, by Dr. Wilmont Hess, University of California. (Dr. Hess is now associated with Goddard.)

• Lower Van Allen Belt Studies by Dr. S. Bloom, University of California.

• Emissivity Stability of Surfaces in a Vacuum Environment Experiment by Dr. G. G. Robinson, NASA Ames Research Center.

• Solar Gamma Rays Experiment (100 Mev-500 Mev) (High Energy Distribution) by Dr. M. Savedoff and Dr. G. Fazio, University of Rochester.

Ball Brothers Research Corporation of Boulder, Colorado, as prime contractor to Goddard produced the spacecraft.

At a news conference held on March 13 NASA officials said, the spacecraft called OSO is transmitting the best radio signals yet received from a satellite.