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GODDARD NEWS

SSS Now Explorer 45

The seven advanced scientific experiments aboard Goddard's first Small Scientific Satellite (SSS or S³) have been turned on and the spacecraft declared operational on November 22. The 114-pound satellite, named Explorer 45 in orbit, is one of the most advanced to date in the U.S. Explorer series.

Project Manager Gerald W. Longanecker says, "The experimenters are elated with the quality of the data they're getting. We look forward to significant scientific results."

SSS was launched on November 15 by a four-stage NASA Scout rocket from the Italian-operated San Marco launch platform in the Indian Ocean off the coast of Kenya. The launching was witnessed by several hundred viewers at the San Marco base camp and the Santa Rita control platform. These included the Italian Minister for Research, R. H. Rapamanti; ten members of the Italian Parliament, Kenya officials, and members of the Kenya diplomatic corps.

From its egg-shaped orbit over the equator, the Small Scientific Satellite is conducting a detailed investigation of the environment of the Earth's inner magnetosphere. The magnetosphere is an enormous teardrop-shaped region surrounding the Earth and is formed by the solar wind—a supersonic stream of particles—"blowing" on the Earth's magnetic field.

The mission of SSS is to investigate the causes of world-wide magnetic disturbances associated with large solar flares. These disturbances are produced by the sudden appearance of low energy protons well inside the trapping region of the magnetosphere, but the means by which these protons enter the magnetosphere is at present unknown. The SSS has been designed and instrumented to map in detail the energy spectra and angular distribution of these particles and to determine the ways in which their motion changes with time. These measurements are expected to furnish clues to the origin of these particles and how they are lost once they become trapped.

Specific SSS scientific objectives include: studying the development of magnetic storms and the ring current; investigating

the relationship between the aurora, magnetic storms and the acceleration of charged particles within the inner magnetosphere; studying time variations of trapped particles; studying electrostatic waves in the inner magnetosphere; investigating the movement and intensities of electrons and protons; and investigating magnetic field strengths, fluctuations in the field and spectrum of electric fields in the inner magnetosphere.

From an engineering standpoint, the spacecraft is the most innovative and compact satellite to date in the Explorer series. For the first time on a satellite, an on-board data handling system can be reprogrammed by ground command to concentrate on specific sets of data which are related, for example, to sudden events such as a magnetic storm or to unanticipated phenomena occurring in the inner magnetosphere.

The SSS structure is made from thin sheet aluminum with riveted joints instead of the traditional machined sections. This technique, comparatively new to satellite construction, reduces the weight and construction costs significantly.

Goddard's Small Scientific Satellite team is headed up by Gerald W. Longanecker, Project Manager; Dr. Robert A. Hoffman, Project Scientist; Frank A. Carr, Assistant Project Manager; Kenneth O. Sizemore, Project Coordinator; Sterling R. Smith, Project Operations Director; and Robert G. Martin, Electronic Systems Manager; Vernon L. Krueger, Electronic Integration Engineer; Xopher W. Moyer, Mechanical Systems Manager; John E. Oberright, Thermal Systems Engineer; Thomas A. LaVigna, Power Systems Engineer; William F. Mack, Mission Operations Manager; Virgil L. Cleveland, T&E Support Manager; Bruno P. Baldini, Quality Engineer; Frank A. Keipert, Tracking Scientist; Clyde H. Freeman, Data Processing Engineer; George M. Marechek, Orbital Computations Engineer; Roger D. Werking, Attitude Determination Engineer; and Dr. Thomas W. Flatley, Attitude Control and Dynamics Engineer.

Scientific Investigators for SSS are: Dr. Robert Hoffman of GSFC and David S. Evans of NOAA for the Channel Electron Multipliers;

(See Page 4)

GREETINGS FELIZ AÑO NUEVO HAPPY HOLIDAYS BONNE ANNÉE WESOLYCH ŚWIAT PEACE

A Month in Review

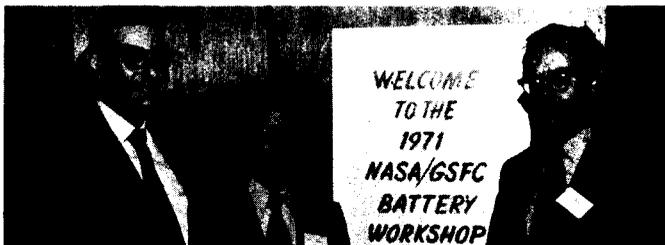
- Nov. 9-12 Network Station Directors conference at Rosman, N.C. See page 5.
 Nov. 13 Mariner 9 in Mars orbit. See page 3.
 Nov. 15 Launch of the first Small Scientific Satellite (SSS). See pages 1 and 4.
 Nov. 15-16 Forum on Man, Society and Technology. See page 10.
 Nov. 17-18 NASA/GSFC Aerospace Industry Battery Workshop. See Page 2.
 Nov. 19 Goddard Annual Awards Ceremony. See pages 6 and 7.
 Dec. 6 ERTS Investigators Working Group Meeting. See page 2.

Battery Workshop Held Here

On November 17 and 18, Goddard was host to the 1971 NASA/GSFC Aerospace Industry Battery Workshop. The nearly 100 attendees present included representatives from government, cell manufacturers and battery users. Seven men came from Canada, and one from France.

The purpose of the workshop was to discuss problems and improvements in the development of nickel cadmium cells and their components. The exchange of information covered the development of new hermetic seals, improvement of separator material, better control and uniformity of plate materials, more reliable information on orbital and synchronous cell operation and finally the definition of the problem areas which need further study.

Goddard chairmen for the workshop were Gerald Halpert of the Material Engineering Branch who led a session on plate materials and cell precharge, and served as overall workshop co-ordinator; Thomas J. Hennigan, Head of the Electrochemical Power Source Section, who led a session on ceramic/metal seals and separators; and Floyd E. Ford of the Power Sources Branch who led a session on cell performance and specification experience.



BATTERY WORKSHOP CHAIRMEN are (from left) Gerald Halpert Workshop Co-ordinator Floyd Ford, and Thomas Hennigan.



OVER 400 PARTICIPANTS attended the ERTS Investigators Working Group Meeting held here at Goddard December 6-8. The three-day conference was held to convey to the 270 user/investigators of the Earth Resources Technology Satellite (ERTS)-A the many technical and administrative intricacies that will face them when the spacecraft is launched. Both government and non-government users from the U.S. and many foreign countries sent representatives. The group of participants shown above are (from left) D. A. Landgrebe, Purdue University, R. Legault, U. of Michigan, T. Ragland, GSFC, L. Gonzales, GSFC, A. E. Davis, U. of California, R. Colwell, U. of California, John Sos, GSFC, B. Bachofer, G. E., John Over, GSFC, E. Yost, Long Island University, R. Holmes, GSFC, F. Gorden, GSFC, P. L. Smith, GSFC, and P. Fishman, G. E.

Goddard Mourns...

Herbert W. Grandy passed away on November 7, 1971, at the age of 64. As a building engineer in the Utilities and Operations Branch of the Plant Operations and Maintenance Division. Mr. Grandy was directly involved in the Building 11 fire in December of 1969. As a result of his courageous action during that incident, Mr. Grandy received a letter of commendation from President Nixon and a NASA Superior Achievement Award.



Mr. Grandy came to Goddard in 1967 from General Services Administration.

Funeral services were held in his home town, Byesville, Ohio. Surviving are his wife, three children and two grandchildren.

Polar Caps Discovered on Sun

Like the Earth and Mars, it now appears the Sun has polar caps. But, with a temperature of about one million degrees Kelvin, the Sun's polar caps are not the frozen white variety we are used to.

The discovery was made by the latest Orbiting Solar Observatory (OSO 7) that was placed into Earth orbit on September 29. Measurements showing the solar caps were made by an experiment developed by Dr. Werner Neupert and his co-workers here at Goddard.

The solar caps do not appear in conventional photographs as round white formations like those of Earth and Mars, but they do show up in electronic measurements made into multicolor pictures as black areas on the north and south poles of the Sun.

The normal temperature of the corona, except for the polar areas and a few hot spots around active regions, is about two million degrees. However, the polar caps, clearly shown by OSO-7 readings, have temperatures of only about one million degrees. The hot spots, storm centers or active regions often associated with giant solar explosions called flares, register three to four million degrees. Flares themselves are several times hotter again, at least ten million degrees.

Scientists looking back on sounding rocket experiment data from a period of several years prior to the launch of OSO-7 September 29, 1971 from Cape Kennedy, Fla., now re-interpret previous information to show evidence of "seasonal" variations in the size of the caps. If this proves to be true, the polar caps are largest near the time of least solar activity and perhaps disappear near times of maximum activity.

At solar cycle maximum, about every 11 years when there is greatest solar activity, the magnetic field near the poles reverses itself. This, coupled with the probable disappearance of the polar caps at the same time, suggests that the location of the cap edges marks a magnetic boundary deep in the Sun. There is no way of confirming this because present instrumentation cannot probe the solar interior deeply enough.

OSO-7 is studying the Sun to learn more about our nearest star which is not only the source of all life-giving energy, but, especially in its active periods, is believed to have a strong influence on Earth's weather and certainly on global communications.

Mars/Mariner 9

Mars is apparently a very hostile planet. There is the possibility of volcanic craters, its atmosphere is saturated with a fine dust and the surface is suspected of being extremely rough in many areas. The dust storm that has swept over the entire surface of the planet may be around for many months. That's an early picture of the "red planet" from data received from the Mariner 9 spacecraft that has been in orbit around Mars since November 13.

Providing some of the data on the Martian environment is the Goddard Infrared Interferometer Spectrometer (IRIS) experiment package aboard Mariner 9. The IRIS experiment is designed to obtain a temperature profile of the Martian atmosphere and determine its composition. IRIS will also obtain information on the make-up of the Martian surface material. The IRIS experiment team is headed by Dr. Rudolf Hanel of the Laboratory for Planetary Atmospheres.

Data obtained by the IRIS indicate that the upper atmosphere of Mars is considerably warmer than expected. IRIS team member Dr. Barney Conrath reports that temperatures 10 to 15 kilometers above the surface are between 200 and 220 degrees Kelvin. (-100 to -63 degrees Fahrenheit). Predicted temperature was about 160 degrees K. (-172 degrees F.). Temperatures nearer the Martian surface are close to the predicted. There is the possibility that the dust in the atmosphere is causing the warmer temperature in the upper atmosphere.



DR. RUDOLF HANEL, IRIS principal investigator on the Mariner 9, reports early findings at a news conference at the Jet Propulsion Laboratory in Pasadena, California. The IRIS (Infrared Interferometer Spectrometer) experiment package on Mariner 9 is similar to the IRIS flown on Goddard's NIMBUS spacecraft.

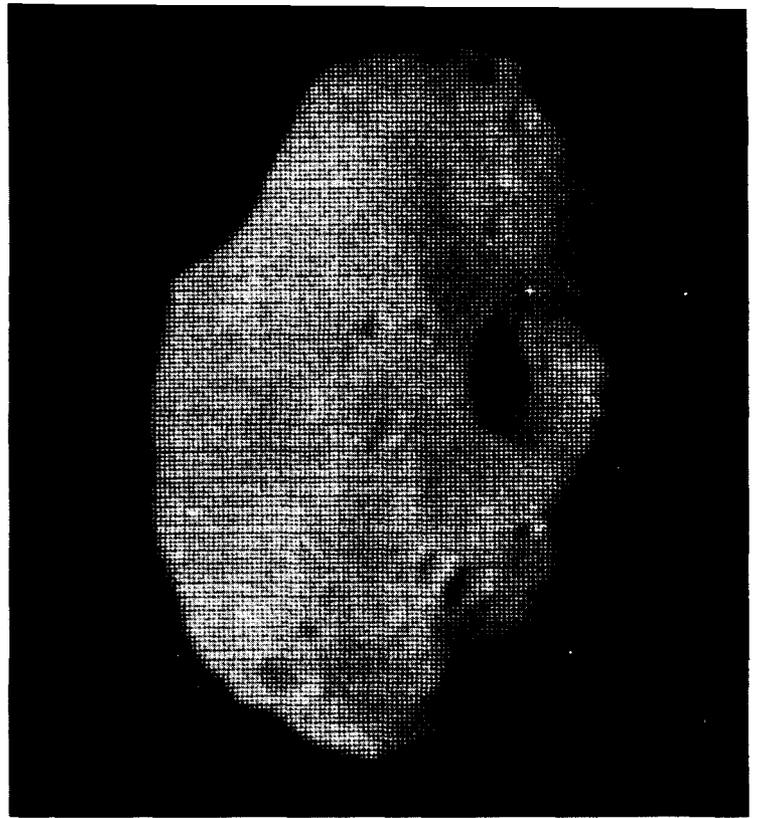
Investigators were surprised when data showed that an area of the atmosphere over the south polar cap at an altitude of about 10 kilometers was warmer than the surrounding atmosphere.

The IRIS also detected water vapor in the Martian atmosphere. The greatest amount of vapor was found over the south polar cap. Slight traces of water vapor have been detected over other parts of the planet.

The temperature gradient of the atmosphere, according to the IRIS data, is very low. This indicates that vertical turbulent transport of the dust particles is almost nonexistent. This would further indicate, according to Conrath, that the winds that whipped the dust into the Martian atmosphere had subsided by the time Mariner 9 went into orbit.

Dr. Warren Hovis, another co-investigator, says the dust that shrouds the planet is extremely fine. He says that it may be as small as one to two microns in size. The dust suspended in the atmosphere above Mars could remain so for much longer than the basic 90-day mission of the Mariner spacecraft.

The make-up of the surface of Mars is expected to take much longer to determine. Data indicated the surface is of rock-like mate-



PHOBOS, one of the two Martian moons, was photographed by the Mariner 9 narrow angle camera on November 30. The dark spot (upper right center) is a crater about 7 kilometers (4.3 miles) across. Phobos itself is about 21 km. (13 mi.) high and about 25 km. (16 mi.) long, almost potato-shaped. The photograph was taken during the 34th orbit of Mars by Mariner 9. The spacecraft was 5543 kilometers (3444 miles) from Phobos when the picture was taken.

rial as it has a high silicon dioxide signature. Material suspended in the atmosphere has made the surface investigation problem extremely difficult.

Television experimenters have been disappointed in their results. The dust storm has obscured most of the planet from the cameras except for high contrast areas and what appears to be extremely high elevation areas on the surface. Several areas are suspected of having active volcanic activity. The theory followed the identification of several very hot areas on the surface. Pressure measurements also indicate that the surface of the planet is very rough in some areas.

Information gathered by the Mariner experiments has been sent to the Soviet Union over a direct telex system between the Jet Propulsion Laboratory and its Russian counterpart. The Soviets report a capsule, from the Mars 3 spacecraft that is in Martian orbit; has landed on the surface.



THE IRIS EXPERIMENT TEAM discusses data received from Mariner 9 in the IRIS Science Room in the JPL Spacecraft Mission Operations Facility. Clockwise, from lower left are Gil Levin, Tom Burke, Pat Stratt, Barney Conrath, Lloyd Purvis (rear), Virgil Kunde, Rudolf Hanel, Warren Hovis and Paul Lowman. Missing from the photo are John Peal and Ron Long. All except Burke are from Goddard.

SSS . . . From Page 1

Dr. T. A. Fritz and Dr. Donald J. Williams of NOAA, and Dr. A. Konradi of MSC for the Solid State Proton Detector; Dr. Donald Williams of NOAA for the Solid State Electron Detector; Dr. L. J. Cahill of the University of Minnesota for the Flux Gate and Search Coil Magnetometers; Dr. Nelson C. Maynard of GSFC for the DC Electric Field Measurement Experiment; and Dr. D. A. Gurnett and G. W. Pfeiffer of the University of Iowa for the AC Electric Field Measurement Experiment.

The three engineering experiments carried by the spacecraft were all developed at Goddard. Investigators are: John E. Oberright for the Aerodynamic Heating Experiment; Robert G. Martin and Harry E. Wannemacher for the Radiation Damage Experiment; and William D. Hibbard for the Scanning Celestial Attitude Determination System (SCADS).



THE EDEN ROC HOTEL in Malindi, 20 miles south of the launch site, was "home" for the SSS team.



GODDARD'S Dr. Nelson C. Maynard, the DC Electric Field Measurement experimenter, and Ken Gardner, prepare to mount experiment spheres on SSS.



GERALD LONGANECKER and Robert C. Baumann, Assistant Director for Project Support, work during pre-launch operations at the Santa Rita Platform.



A GRACEFUL WATER BUCK watches photographer from a hill in Tsavo Park, world's largest national park located near Malindi.



"WELCOME ABOARD!" Gerald Longanecker and Italian colleague are lifted on the Billy Pugh net onto the San Marco Platform.



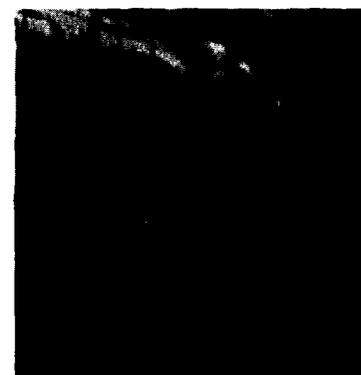
GODDARD AND ITALIAN experts prepare to "button up" the 114-pound SSS.



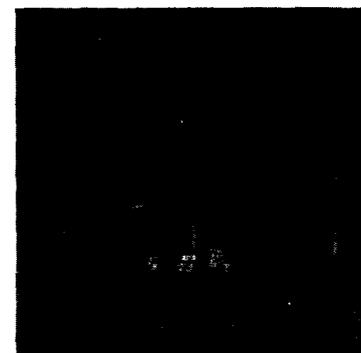
THE AFRICAN SUN silhouettes Scout rocket carrying the Goddard-built Explorer 45.



SAN MARCO PLATFORM on launch day, November 15, with Scout rocket erected for launch.



FORMER ASTRONAUT James A. McDivitt, now Apollo Spacecraft Program Manager, and Gerald Longanecker inspect Scout rocket at San Marco Platform. McDivitt spent six days at the site observing the operation.



THE SANTA RITA PLATFORM, where launch operations are conducted, is a converted ocean oil-drilling rig.

Suggestion Awards Go to Pagac and Lewis



BENEDICT B. PAGAC and Vernon L. Lewis display the awards they received for suggestions made earlier this year. From left are Herbert J. Fivehouse, Chief of the Management Services and Supply Division; Mr. Pagac, Samuel W. Keller, Deputy Director of Administration and Management; Mr. Lewis, William E. O'Connor, Foreman of the Boiler, Refrigeration and Diesel Plant; Jacques D. Knox, Chief of the Plant Operation and Maintenance Division; and Malcolm J. Tarlton, Head of the Utilities and Operations Branch.

Benedict B. Pagac and Vernon L. Lewis received Suggestion Award citations and checks from Samuel W. Keller, Deputy Director of Administration and Management, during a special ceremony in Mr. Keller's office on November 10. Mr. Pagac is Goddard's Emergency Preparedness Coordinator and Civil Defense Planning Officer. Mr. Lewis is an operator for the Center's Boiler, Refrigeration and Diesel Plant. To earn their awards, both men made beneficial suggestions in areas beyond the scope of their normal job responsibilities.

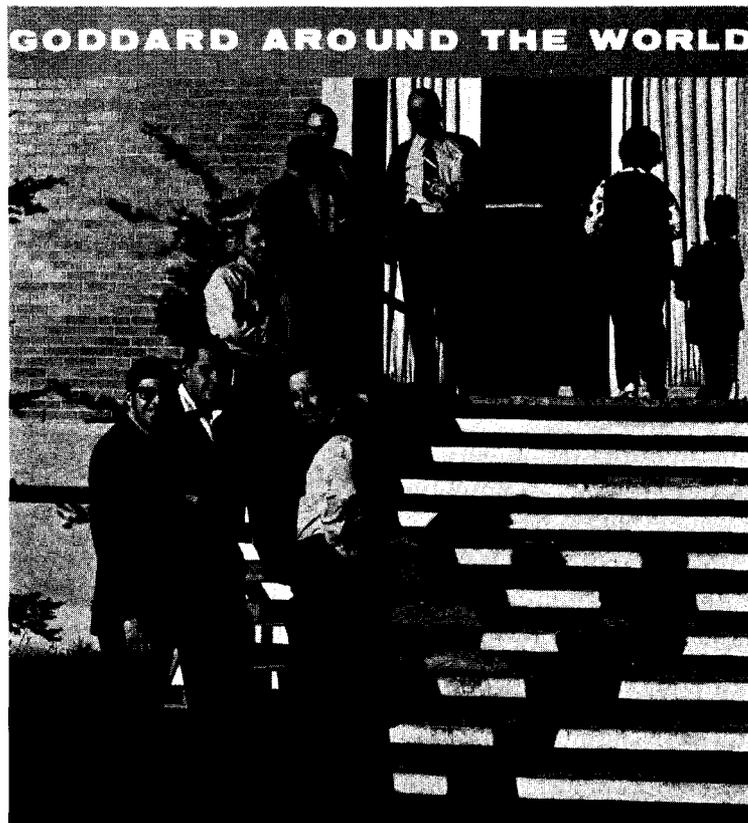
Mr. Pagac's idea began when he noted that individual users of the IBM Magnetic Tape Selectric Typewriters had been ordering tape cartridges directly from the company. In February of 1971, he suggested that the cartridges be purchased in bulk from the GSA Supply Schedule and placed in the GSFC stores and stock system. Estimated savings from this action will come to about \$15,000 a year.

Mr. Lewis suggested a safer and more economical way to change the oil in the gear boxes of the cooling tower fans on top of Building 24. Previously, the oil had been hand carried up a ladder or hoisted up to the top of the tower with a block and tackle and hand line. Mr. Lewis thought the ladder looked unsafe and suggested that a system of galvanized pipes be used to flush out the old oil from the gear boxes and to pump new oil in. The new system, put into effect last August, is much safer and saves about ten man days each time the oil must be changed.

Ethel Merman at Goddard



ETHEL MERMAN, who visited Goddard on November 24, listens as Al Jahnigen places a test call to Australia at the NASCOM voice network switchboard. Mrs. Robert Shafer observes the tour which was conducted by William P. O'Leary of the Special Programs Office.



NETWORK MEETING. The first Station Directors conference since Goddard's two tracking Networks were combined last May was held on November 8-11 at the Sapphire Valley Inn in Sapphire, N.C. Shown here at the near-by Rosman Tracking Station during the conference are (from the top) Jeff Speck of Ascension Island, Lloyd White of Corpus Christi, Otto Thiele (back to camera) of the Vanguard, Wylie McMillan of Bermuda, Chet Shaddeau of Santiago, Bill Edeline of Tananarive and Dennis Wilshire of Orrol. Object of the meeting was to discuss new business procedures of the combined NASA Spaceflight Tracking and Data Network (STDN) and to solve problems associated with the re-organization.

Santiago Helps in Medical Emergency

Goddard's tracking station in Chile helped save a man's life following an auto accident near Santiago. During a road race, one of the racing cars crashed and caught fire. The co-driver was killed, and the driver suffered burns over more than 45% of his body as well as other injuries.

The Chilean medical authorities contacted NASA Santiago on November 19 in search of tissue for skin grafts. Station Director Chester Shaddeau at Santiago called the NASA Communications Division via SCAMA. NASCOM personnel then located, through the help of NIH, the source of skin tissue at the Naval Medical Research Institute at the National Naval Medical Center.

The following message from STADIR Shaddeau to Dr. Robert Bright at the National Institute of Health in Bethesda is self-explanatory.

"12 BOTTLES OF HOMOGRAPH SKIN ARRIVED ON AFTERNOON OF 20 NOV. ON BRANIFF INTERNATIONAL AIRLINES. SKIN IMMEDIATELY TAKEN TO HOSPITAL. DOCTORS HERE AMAZED BY COOPERATION FROM NASA AND N.I.H. AND CONSEQUENT DELIVERY LESS THAN 20 HOURS AFTER TALKING TO YOU. WORDS CANNOT EXPRESS THEIR GRATITUDE NOR THAT OF FAMILY AND FRIENDS OF INJURED MAN. VOICE CONTROL, GSFC, RATES MY SPECIAL THANKS FOR FINDING THE PHONE NUMBERS AHEAD OF TIME AND HELPING US WITH LANGUAGES AND PROCEDURAL DIFFICULTIES DURING THE SCAMACON BETWEEN DOCTORS."



Robert J. Anstead



Marvin S. Maxwell



Robert J. Coates



Evert Dale Nelsen



John L. Donley



Henry W. Price



Harold B. Goldberg



Aaron Temkin



Donald A. Krueger



David W. Walden



John D. Mangus



Donald P. Wrublik

1971 Goddard A

Goddard's Annual Awards Ceremony, held on November 19 in the Building 8 Auditorium, was one of the largest in the Center's history.

Donald P. Hearth, Goddard Deputy Director, presented the awards which included 13 GSFC Exceptional Performance Awards, four Group Achievement Awards, and Career Service Awards for over 300 employees. In addition, special recognition was extended to Goddard employees and groups who received awards at the annual NASA ceremony held on October 29 in Washington, D.C.

The GSFC Exceptional Performance Award went to: Robert J. Anstead, of the Parts Branch, for leadership in the development of laboratory and screening techniques; Dr. Robert J. Coates, Chief of the Advanced Data Systems Division, for leadership in the development of scientific and engineering concepts to meet the space program's tracking, communication and data processing requirements; John L. Donley, of the OSO 7; Harold B. Goldberg, of the Parts Branch, for initiative and creativeness in the development of a microcircuit program to improve the reliability of the Nimbus E and F, and ERTS spacecraft; Donald A. Krueger, Head of the Electronic Integration Branch, for leadership in the integration of satellites; John D. Mangus, Head of the Optics Branch, for leadership in the research and development of new technology in the fields of optical research and applied optics; Marvin S. Maxwell, Head of the Data Management Section, for contributions in the fields of spacecraft data handling and digital data processing systems; Evert Dale Nelsen, ISIS Project Manager, for contributions to the conduct of the International Satellites for Ionospheric Studies Program; Henry W. Price, Associate Chief of the Earth Observations Systems and Systems Engineering Division, for leadership in the fields of spacecraft dynamics, control systems and complex electromechanical mechanisms; Salvador V. Rubio, of the Network Operations Division, for outstanding performance in developing and administering a training and phase-in program which contributed to the successful support of Apollo 15 by the Madrid Station; Dr. Aaron Temkin, Head of the Theoretical Studies Branch, for skillful application of physical intuition and mathematical methods to solving Schrodinger's wave equation; David W. Walden, Assistant Chief of the Manpower Utilization Division, for leadership in the development of a personnel management assistance program; and Donald P. Wrublik for outstanding service as SAS-A Project Operation Director.

Goddard Group Achievement Awards were presented to: The Data Processing Team for the successful elimination of a large telemetry data backlog; the Facilities Mission Support Team for maintaining continuous operation of power equipment essential to tracking, data and communications support of manned flight missions; the IMP-I On-Board Computer (SDP-3) Team for developing the first general purpose computer suitable for flight and capable of being programmed from the ground; and the OAO 2 Operations Team in recognition of dedicated and outstanding performance in extending the orbital operations of OAO 2 far beyond original mission objectives.

Career Service Awards for 35 years of government service went to Isidore Adler, Dominic J. Amendolair, Russell E. Dorrell, Hayes T. Jackson, John E. Liner, John J. Napora, Willard C. Passo, Louis C. Robertson and John T. Shae. Also presented were 111 awards for 30 years of service, 90 for 25 years and 112 for 20 years. Rudolph Decatur with 40 years of government work to his credit was not at the ceremony and received his Service Pin later.

Not shown is Salvador V. Rubio who is at the Madrid Station.

Awards Presented

During the Goddard ceremony, Marjorie R. Townsend, SAS Project Manager, was presented with a NASA Exceptional Service Medal for technical and managerial leadership of the Small Astronomy Satellite program.

Recognition of previously received NASA Exceptional Service Medals went to: Paul Butler, Chief of the Explorer Projects Office and IMP Project Manager, for leadership and direction of the Interplanetary Monitoring Platform series of spacecraft; Albert G. Ferris, Associate Director for Mission Operations, M&DOD, for contributions to the successful planning and execution of advanced mission operations systems in support of NASA, DOD, and international scientific and applications satellites; William A. Mecca, Chief of the Program Support Division, for contributions to the sound management of Goddard research and development resources through new techniques in mathematical modeling and program analysis; Richard L. Nafzger of the Network Engineering Division, for contributions to the success of the Apollo 15 mission; and John M. Thole, OSO Project Manager, for technical leadership in the management of the Orbiting Solar Observatory Project and for his exceptional performance in directing the successful rescue of the OSO 7 mission.

Previous recipients of the NASA Exceptional Scientific Achievement Medal were: Dr. Carl E. Fichtel, Head of the Gamma Ray and Nuclear Emulsions Branch, for contributions in gamma ray astronomy, solarterrestrial physics, and cosmic ray physics; Alton E. Jones, of the Space Applications and Technology Directorate, for technical direction of the studies and system design proceeding toward an operational international air/maritime traffic control satellite system; and Dr. Werner M. Neupert, Head of the Solar Plasmas Branch, for contributions to the knowledge of photon emission from flares and the solar corona.

NASA Group Achievement Awards went to: The Apollo Recovery Communications ATS Satellite Support Team for superior achievement and contributions to the success of Apollo 15; the International Satellites for Ionospheric Studies Project Team for contributions to a cooperative effort of the United States and Canada; and the OSO 7 Recovery Team for technical competence which was indispensable to the successful operation of the Orbiting Solar Observatory 7 spacecraft in spite of serious orbit and attitude discrepancies immediately after launch.



MARJORIE R. TOWNSEND, SAS Project Manager, receives the NASA Exceptional Service Medal from Donald Hearth.



OSO 7 AWARDS. OSO Project Manager John M. Thole shakes hands with Dr. James C. Fletcher, NASA Administrator, before receiving the NASA Exceptional Service Medal at the NASA ceremony on October 29. Mr. Thole and his co-workers received a NASA Group Award during the same ceremony for the recovery of the OSO 7 Mission.



FRANK A. KEIPERT (left) receives a Group Achievement Award for the Data Processing Team from Goddard Deputy Director Donald P. Hearth. Other Group Achievement Awards went to the Facilities Mission Support Team, the IMP-1 On-Board Computer Team, and the OAO 2 Operations Team.



RUDOLPH M. DECATUR, of the Procurement Division, receives a 40 Year Career Service Award from Samuel W. Keller, Deputy Director of Administration and Management. Mr. Decatur could not make the Goddard Awards Ceremony, so his award was presented two weeks later. Shown during the presentation are (from left) William B. Melchi, Head of the Operations Analysis Office; Mr. Decatur, Mr. Keller, and J. O'Neil Mackey, Chief of the Procurement Division.

Temperature Controls Training

Over 40 employees from the Plant Operations and Maintenance Division have completed three training courses designed to give them a better technical knowledge of Goddard's temperature control systems and equipment. The men are responsible for the maintenance and operation of pneumatic controls throughout the Center.

The 40-hour courses were given by Minneapolis-Honeywell, Inc., Johnson Service Co., Powers Regulator Co. and Robertshaw Controls. In addition, some of the men received training on the Pyr-A-Larm equipment installed at Goddard, and some are now in a controls course given by Robertshaw.

Jacques Knox, POMD Chief, first identified the need for this instruction when he noted that, because of attrition, many of Goddard's building engineers and airconditioning and refrigeration mechanics had no formal training on the various control systems used on Center. The courses were arranged for by Employee Development through the coordination of Gladys Chasnoff.

The resulting program may be the first series of such training courses provided by a government agency which offers employees instruction in pneumatic controls with some of the country's major control companies participating in the curriculum. This comprehensive training program provided employees up-to-date working knowledge on various aspects of control systems, with each participant gaining sufficient technical background to diagnose and trouble-shoot deficiencies with greater efficiency.

The following employees took part in this training: Ira R. Beckner, Robert S. Bujanski, Joseph I. Burgess, Sunday Capretti, Joseph Carafelli, Clifford Coryell, John E. Donaldson, Albert M. Dunnington, Robert M. Earnest, John M. Garrett, William J. Gautier, Paul A. Grim, Franklin D. Habas, William Hall, Allen N. Harris, Otto Hildebrand, Patrick Hinkson, Harry B. Hull, Richard L. Jones, Herbert Kahl-Winter, Philip H. Kinney, Robert W. Langley, Hay K. Lee, Vernon Lewis, Andrew J. Mazurick, James R. McCann, Gerald F. Moran, William E. Olson, Willard Passo, Joseph G. Pometto, John M. Ramsey, Loyd T. Rollins, John P. Small, Robert H. Stewart, Ralph Strnad, Olen T. Taylor, William A. Trudeau, Leslie E. Twitty, Robert L. Ward, William T. Warrick and Gerald H. Wolfe.



NADINE WOODWARD, daughter of Leon Woodward of the Documentation Services Section, recently received a letter from President Richard Nixon for her "splendid efforts on behalf of language handicapped children." Nadine first became interested in helping deaf children when it was found that her younger brother Donald (shown with her above) had a severe hearing loss since birth. She has worked as a volunteer aide in the Montgomery County summer auditory program. Last spring, during her last year at White Oak Junior High School, she organized a fund raising campaign for the Montgomery County Association for Language Handicapped Children and, with the help of her fellow students, collected \$611.91. Nadine, age 14, is presently a sophomore at Springbrook High School.

Scuba Club at Gaywood School



TOM RATLIFF (left) and Ron Miller of Goddard's Scuba Club discuss a rubber powered spear gun with Gaywood students.

On November 17, Tom Ratliff and Ron Miller of Goddard's Scuba Club introduced 120 students of the Gaywood Elementary School in Seabrook to the world of diving and underwater exploration. Two separate lectures were given. Diving apparel was displayed, and the students were allowed to try on the equipment and breathe from an air tank.

Questions were the order of the day. Interested students requested information on sharks and other potentially dangerous sea life, the cost of equipment and the locations of nearby diving sites.

The Gaywood lectures were requested by Mrs. Irene House, wife of Goddard's Clarence House.

The Scuba Club was formed to fill a need here at Goddard. The educational aspect was not anticipated, and comes as a welcome bonus to club members.



RON MILLER demonstrates the operation of a double hose regulator during Scuba Club lecture in the Gaywood Elementary School library.



Bromberg Wins Goddard Chess Tournament

Bruce Bromberg of the Stabilization and Control Branch, is again Goddard Chess Champion. During the Goddard Chess Club Championship Tournament held this fall, he crushed all opposition by scoring four wins and no losses in the four round, Swiss system tournament. Bromberg, a first class chess player has now won two Goddard championships in a row and stood high in all earlier tournaments.

Second place in the tournament went to Dr. John Price of the Theoretical Studies Branch. Dr. Price, also a former Goddard title holder, made a score of 3½-½, or three wins and one draw.

First place in the Class B championship was won by Daniel Dembrow, of the Delta Project, who scored 3-1, or three wins and one loss.

The Goddard Chess Club had an interesting program featuring activities of interest to chess players of all strengths. The club meets every Tuesday evening in the Building 1 Cafeteria.

Future evenings will feature speed chess tournaments, lectures on the chess openings and a computer chess night when club members and their guests will challenge Chris Daly's chess playing computer. Anyone wishing to attend should contact club president Dr. Floyd Stecker on extension 2280.



GODDARD Chess Champion Bruce Bromberg ponders a move.

Paul Garber Talks To Flying Club



On November 16, members and friends of the NASA Flying Club enjoyed a presentation given by Paul Garber, former curator of the Smithsonian Air and Space Museum, on the "13 Most Famous Aircraft of All Times". Mr. Garber personally knew Wilbur and Orville Wright, whose plane was the first of the 13, and since that time he has been active and interested in all

phases of aviation. Some of the other planes selected and presented were the DC-3, Cornet, X-15, and the present day 707. The Club hopes to have Mr. Garber return for another interesting talk in the coming year.

The NASA Flying Club became a member of GEWA in September of this year and is open to all GSFC Government and contract employees. It was organized to promote all aspects of aviation—education, social, safety, maintenance, recreation, flying, etc. The club at present has 35 members. It has arrangements which will help interested persons to learn to fly, a ground school class and chart and equipment supplies. The club is interested in obtaining its own airplane and is actively working on this goal.

Roadblockers Softball Champs



MEMBERS OF THE ROADBLOCKERS, Goddard's champion softball team, are (from left, front) Jim Stephens, Jim Kortises, Bill Fahey, Phil Marcus and John Zaniewski. In the back row are John Firmin, Lou Noordzy, John Underwood, Bud Tidwell, and Tom Canning. Not shown are Nick Witek, Frank Stocklin, and Evan Gull.

The Roadblockers, managed by Bill Fahey, won the 1972 Goddard Slow Pitch Softball Championship in a double elimination playoff with the OAO-2 team, winner of the National League; and the Sperry Hi-Jackers, winner of the International League. The Roadblockers went undefeated in the GSFC championship playoffs to top off a very good year. The Boosters, the 1970 GSFC champions, won the Continental League championship. The 1971 season awards were presented at the annual Softball Awards Banquet which was held at DeMatha High School's Antler Room on October 15th.

The Goddard Slow Pitch Softball Association had a record 40 teams with over 600 GSFC personnel participating. The association was organized into four ten team leagues with each league playing on a given night of the week, Monday through Thursday. The association played on the five softball fields at the GSFC antenna range on Beaver Dam Road. The association, with GEWA's financial support, maintains the softball facilities and has its own umpiring association which has built a reputation over the past several years and has been requested to umpire for outside leagues.

League champions are determined by a playoff between the winners of each half season. The champion team from each of the American, National, and International Leagues compete for the GSFC Championship. The Continental League, which plays on Monday night, provides interested teams with an opportunity to play a second night each week and therefore these teams are not eligible for the GSFC Championship.



DOTTY LEYH, Softball Association Secretary, presents a trophy to John Hesenei of the Boosters, winners of the Continental League.

Goddard Hosts Forum Man/Society/Technology

Goddard's Educational Programs Office hosted the Industrial Education Mideast Regional Forum on November 15 and 16, 1971. The forum was conducted by the American Industrial Arts Association in cooperation with the Bureau of Educational Personnel Development, U.S. Office of Education.

The forum brought together sixty-six leaders of industry, education, and government from Virginia, Maryland, District of Columbia, Pennsylvania and Delaware. For two days the forum directed its attention to involving the organized resources of our society in examining the problems and promises of technology as it relates to man and his environment, with the focus on improvement of industrial arts education.

After the welcome to the Goddard Space Flight Center by Edward Mason, Director, Office of Public Affairs, Dr. Frederick Tuttle, Director, Educational Programs Division, NASA Headquarters, greeted the group. Dr. Tuttle expressed NASA's interest in cooperating with industry and industrial arts educators. The meeting at GSFC was the eighth forum to be conducted at a NASA field center.

Observations made by the participants concerning technology/society relationships were that man has not developed the ability to comprehend and deal effectively with the social problems related to technology. Secondly, man must not only develop technical competency but an understanding in himself of his relationship to a higher technical society, and lastly that education must be made to relate to the technical world of work. The whole structure of the educational system must be examined to provide the most relevant and purposeful education possible for all youth of our nation.

According to Dr. C. Dale Lemons, National Program Director for the Forums, plans were developed for continuing the dialogue started in this regional forum. Two states made definite plans for a similar forum to be held in their state. Other states designed a program to promote the establishment of industry-education coordinators at the state level.



J. LEE HAMILTON, Vice President of the National Association of Manufacturers, addressed the forum on "The Four R's" in the Educational Partnership."



DR. BEVAN FRENCH, of Goddard's Planetology Branch, explained various aspects of lunar history and described the on-going analysis of the lunar samples.



DR. JOHN MCKETTA, E. P. Schoch Professor, Department of Chemical Engineering at the University of Texas, keynoted the first day's activities with a presentation on "Technology—Promises and Problems for Man and His Environment."



THE BACKGROUND of the forum project was explained by Dr. Edward Kabakjian, American Industrial Arts Association Executive Secretary.



DR. DONALD MALEY, Head of the Department of Industrial Education at the University of Maryland, welcomed the forum participants on behalf of the industrial education community. Dr. Maley was also the featured speaker at the Monday evening banquet.



FORUM PARTICIPANTS discussed problems in small group sessions. Representatives from various states worked together during the first two-hour session, while during the second day representatives from each of the five states met to formulate state-wide plans to action.



THE MIDEAST FORUM attendees included eleven presidents, vice presidents and representatives from industry, four presidents and vice presidents from colleges and universities, three presidents and vice presidents from state PTA's, six representatives from education associations and school boards, one delegate to the Maryland House of Delegates and one assemblyman from New Jersey.



SIDNEY MCLLURE of the Aerospace Metal Forming and Welding Branch explains prototypes of objects demonstrating different welding techniques. D. Wiley Jenkins of the Fabrication Division coordinated a special open house for the forum participants.

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