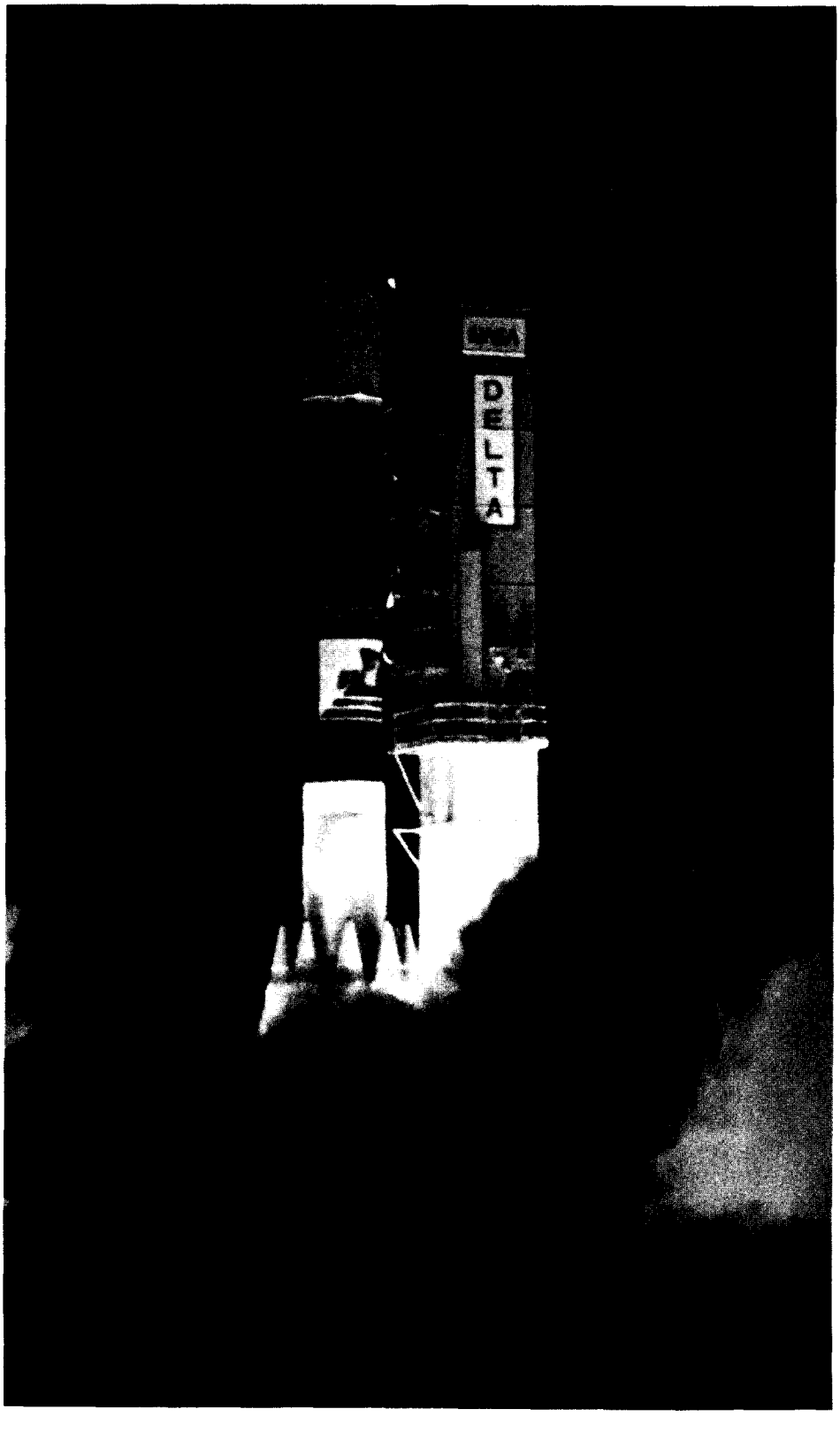
NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

Goddard News

Greenbelt, Maryland and Wallops Island, Virginia

Vol. 35 No. 12 December 1989

COBE Launched To Study Big Bang



In an early morning launch that spectators described as "spectacular," Goddard's Cosmic Background Explorer (COBE) was launched into near-polar orbit onboard the last NASA-managed Delta rocket at 9:34 a.m. (EST) on Saturday, November 18, at Vandenberg Air Force Base, California. Its mission: to examine the cosmic background radiation left over from the "Big Bang" that formed the universe, and answer astronomers' and cosmologists' questions on the origin of the universe.

Goddard employees and their families shared the historic COBE launch in the Building 8 Auditorium. Goddard has been working on the Cosmic Background Explorer since early definition studies began in 1977. The 5,000 pound (2,260-kg) spacecraft and its three infrared and microwave-measuring instruments were designed and built at Goddard.

Now well on its way to look out into space and back in time, the COBE spacecraft has undertaken the esoteric task of providing new insights into the origin and evolution of the universe.

Congratulations to Goddard's COBE and Delta teams!

INSIDE

Center Director Speaks On The Future of Goddard

Page 6

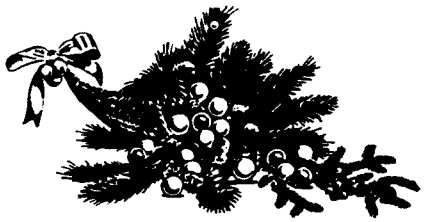
Talk from the Top

John W. Townsend Jr

Q: In light of recent news reports that water from some Halsey-Tailor fountains may be contaminated with lead, we're concerned about the quality of water in our fountains. Does Goddard have a regular testing schedule for its drinking water?

A: Recently GSA issued a data sheet identifying water coolers from several manufacturers as containing components that cause excessively high levels of lead in the drinking water. The Health and Safety Branch is on distribution for such alerts and was screening fountains before the information even hit the news. The original alert has been updated and modified with more manufacturers and detailed information on model members. We have identified several coolers at the action level but still within present standards. In this case, the recommended action level is at 40% of the present standard. Because we take a very protective approach to the welfare of the Center employees, these coolers have been removed from service and are being replaced. We will continue to monitor water quality and replace water coolers as needed. As for overall water quality, our water is the same as the rest of Greenbelt and is tested and chlorinated by the local supplier. Health and Safety also makes routine spot checks of the water quality on Center throughout the year.

Center Director John W. Townsend, Jr. wants to hear from you! Send questions to TALK FROM THE TOP, Code 130.



For snow-related information, and up-to-the-minute news, dial 286-NEWS

Farewell, Old Friend

by Randee Exler

Solar Max came home in a blaze of glory; a burning fireball melting upon reentry. The satellite reentered Earth's atmosphere on Saturday, December 2, at 5:26 a.m. (EST), over the Indian Ocean.

Goddard operations for the Solar Maximum Mission (SMM) ended on Friday, November 24, after flight controllers jettisoned the spacecraft's solar panels. This final engineering test, performed on the descending spacecraft rendered the SMM powerless and marked the end of 9.5 years of solar science from this celebrated space observatory.

The jettisoning of the solar panels ended the life of the spacecraft by depriving it of any way to charge its batteries. The test was performed just prior to the permanent loss of attitude control of the SMM, according to Goddard officials. The SMM tumbled in orbit until it reentered.

Solar Max was constructed at Goddard and launched by NASA to an altitude of 356 miles high with an inclination of 28.4 degrees, on February 14, 1980, to collect and transmit detailed data about solar activity, particularly solar flares. The spacecraft weighed 5,000 lbs. (2268 kg).

The SMM was the first satellite designed for in-orbit retrieval by the Space Shuttle. The SMM Repair Mission of April 1984—the first retrieval and repair of an orbiting spacecraft—invigorated both the manned space program and solar physics. Just two weeks after the spacecraft was repaired by the Challenger astronauts, SMM instruments observed one of the most intense flares of the current solar cycle.

The scientific harvest of the SMM has been substantial. Even a partial compilation reveals remarkable observations and discoveries, as cited by Goddard's SMM Project Scientist Dr. Joseph Gurman:

- In July 1987, the SMM gamma ray spectrometer was the first instrument to detect gamma rays from Supernova 1987a, a distant star which exploded in a neighboring galaxy. The presence of nuclear line emission verified the theory of explosive nucleosynthesis of the heavier elements. This theory helps explain how these elements were formed.
- SMM has detected ten comets colliding with the Sun. The latest collision occurred September 28.
- An ultraviolet spectrometer on board the SMM has been used to measure ozone concentrations in the upper atmosphere. The instruments have detected small increases in high-altitude ozone levels, just North of the Equator coupled with decreases just South of the Equator.

Solar Max has earned its name. What this spacecraft does best is study the Sun during periods of increased activity. The spacecraft was launched near the height of the 11-year solar cycle, which began the rise to its most recent "solar maximum" in late 1986.

Most of the SMM discoveries are in the area of solar flares. The spacecraft has recorded more than 12,500 of these powerful eruptions on the Sun. SMM also made it possible for solar scientists to measure sunspot magnetic fields above the visible surface of the Sun for the first time.

The demise of the SMM does not mean an end to NASA's solar science program, according to NASA officials. Several near-future missions will pick up where Solar Max left off:

- Solar and Heliospheric Observatory (SOHO) - The SOHO spacecraft is part of the International Solar-Terrestrial Physics Program, a concentrated effort to study the interactions in the Sun-Earth system. SOHO, manifested for a 1995 launch, is one spacecraft in this multi-spacecraft mission. SOHO offers continuous viewing of the Sun. It will measure the spectral and total luminosity of the Sun and will investigate the interior structure and outer layers of the Sun, including the acceleration of the solar wind.
- Orbiting Solar Laboratory (OSL) - Scheduled for a 1996 launch, OSL will provide critical, high-resolution solar observations to simultaneously complement measurements from SOHO, the Upper Atmosphere Research Satellite (UARS), and the Earth Observing System (Eos).

In addition, NASA will participate with the National Science Foundation in a multidisciplined study of the solar maximum called Max 91. The program will employ sounding rockets, long-duration balloons and ground-based observations. Among the balloon payloads will be the NASA/Goddard Gamma Ray Imaging Device (GRID).

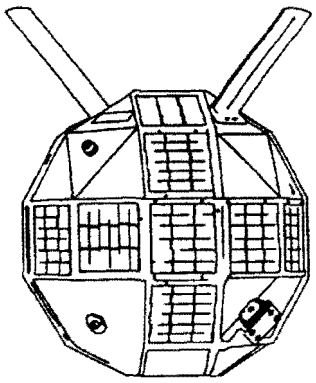
NASA also will fly a soft x-ray telescope on the Japanese Solar-A satellite, scheduled to launch in August 1991. The purpose of this mission is similar to that of the SMM; to study solar flares. A joint U.S./British instrument on board will be a bent crystal spectrometer. The Naval Research Laboratory is the U.S. experimenter for this instrument.

Launch Update: PEGSAT Delayed

Goddard's Pegsat payload launch has been postponed from December 7 to January 17, according to Bob Pincus, Goddard's project manager. The decision to delay the launch from the NASA B-52 was made following a test flight with an inert spacecraft. During the flight, parts of the rocket's thermal coating peeled away, breaking a running light on the B-52 and smashing a porthole covering the airplane's tail camera. The shedding came from body panels on both sides of the rocket, upper wing surfaces and the vertical fin at the tail of the rocket.

The Pegsat payload was designed, built, integrated and tested at Goddard in just six months. It contains a small Navy experimental communications satellite, a NASA chemical release satellite, and a set of sensors for taking flight environment measurements during the runway and launch phases of the mission.

The payload will be launched from the Dryden Flight Research Facility, under the wing of a B-52, the same plane that was used for carrying the X-15 aloft in the 1960's.



NASA Pipeline

LANGLEY RESEARCH CENTER, Hampton, VA—Langley Research Center has selected TRW Inc., Redondo Beach, Calif., for contract negotiations to develop space flight instruments for NASA's polar orbiting platform, the European Space Agency (ESA) polar orbiting platform and Space Station Freedom as part of the proposed Earth Observing System (Eos). The goal of Eos is to advance scientific understanding of the Earth's land masses, oceans and atmosphere, their interactions and how the Earth's system is changing. The two-phase contract is estimated at $37 million. Phase one, a cost-plus-fixed-fee contract, is for 1 year and has an estimated value of $700,000. The contract will take effect about Jan. 15, 1990. Phase two, which will not be implemented until Eos is approved by the Administration and Congress, is a cost-plus-award-fee option. It would be for 8 years and would have an estimated value of $36.3 million. The work will be performed by TRW's Space and Technology Group, Redondo Beach. The company would design, fabricate and deliver up to six instruments for the Clouds and the Earth's Radiant Energy System (CERES) and provide support for integration, launch and mission operations.

LEWIS RESEARCH CENTER, Cleveland, OH—Researchers at Lewis Research Center are studying "slush" hydrogen, a high-energy hydrogen slurry, as the primary propellant for the National Aerospace Plane (NASP). It is denser than liquid hydrogen and requires smaller tanks for the same amount of propulsive capability. The tanks themselves can be lighter in weight because slush hydrogen requires an internal pressurization of only 1 pound per square inch. Also, slush hydrogen is a better coolant for the vehicle and engines than liquid hydrogen. NASP is a joint NASA/Department of Defense program with the ultimate goal of developing an air-breathing experimental flight vehicle designated the X-30. The X-30 will take off horizontally, fly directly into orbit, then land like a conventional aircraft. It also may have the capability to cruise through the atmosphere at sustained hypersonic (above Mach 5) speeds.

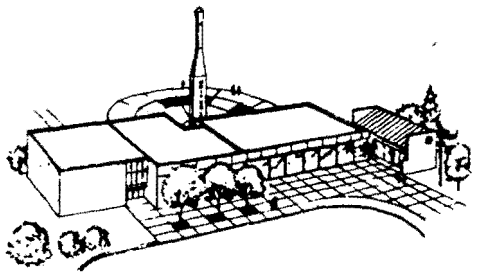
NASA HEADQUARTERS, Washington, DC—NASA is offering 12.5 million tomato seeds to budding student gardeners in the first experiment ever to study the effects of long-term space exposure on living tissue. It has been more than 5½ years since the Space Shuttle deployed 12.5 million tomato seeds, housed in the Long Duration Exposure Facility (LDEF), into Earth orbit. LDEF is scheduled to be retrieved this month during STS-32. SEEDS (Space Exposed Experiment Developed for Students) is a cooperative educational partnership among NASA Headquarters Education Affairs Division, Washington, D.C., NASA's Langley Research Center, Hampton, VA., and the George W. Park Seed Co., Greenwood, S.C.

January Visitor Center Events

The Big Bang: Fact or Fiction?

Launch Site Goddard — Sunday, January 7 and 21, 1:00 p.m. — Bundle up for outside fun!

Saturday Videos — Saturday, January 12, 1:00 p.m. — Learn about Goddard's "COBE," the Cosmic Background Explorer spacecraft launched from California in November. COBE will study the Big Bang explosion that may have started the Universe.



Support your Visitor Center! All events are free. For more information call 286-8981.

Know and Tell — Sunday, January 28, 1:00 p.m. — A representative from the COBE project office will give you a closer look at "The Big Bang: Fact or Fiction." Take a fascinating trip on the COBE satellite and ponder what may be at the heart of the Universe.

Star Watch — Saturday evening, January 13, 7:00 to 9:00 p.m. Winter offers some of the best viewing skies of the year! Join us and learn about heavens.

Goddard Responds to Emergencies

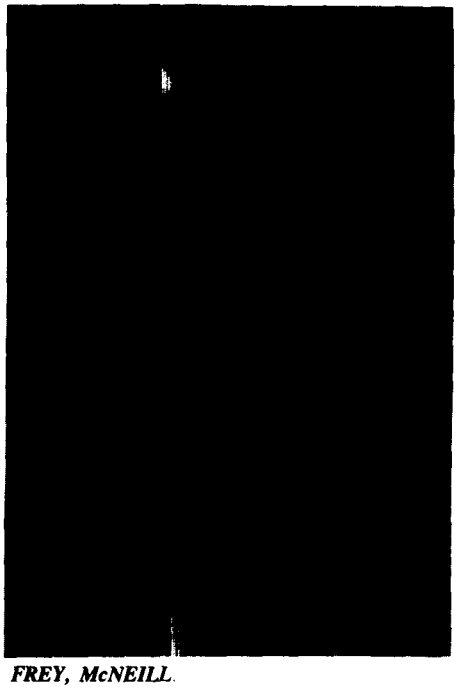
Meet the GERT: Goddard Safety Engineers Do Double Duty

Call the Goddard emergency number, "112", and chances are you will soon meet three young men in cowboy boots. They may be in slacks and ties or black jumpsuits, but the boots are almost always present. No, you haven't gone to JSC, you've just met the members of the Goddard Emergency Response Team, better known as the GERT. You might wonder, why the boots? Because the GERT is composed of three transplanted Texans who respond to all emergencies at Goddard.

"At first we got some strange looks" said team member Mike McNeill, "but now the folks are getting used to seeing us in boots."

The Team consists of John Frey, Phillip Nessler, and Mike NcNeill, all Safety Engineers with the Health and Safety Branch (Code 205.2). They are certified Emergency Medical Technicians (EMT's), Fire Fighters, Rescue Technicians, and Hazardous Material Specialists.

The GERT was the brainchild of the three, who recognized that the Prince Georges County Fire Department could not provide all of the specialized rescue services that were needed at Goddard. In addition, each time the Fire Department responded to a fire at Goddard, at least 12 emergency vehicles would come. A chemical spill would bring even more apparatus. "That would create quite a media field day," noted Nessler.



FREY, McNEILL, NESSLER

The team members can provide the initial response to medical emergencies. The Fire Department provides ambulance transportation, and the Center avoids the cost of the service, while obtaining better emergency medical care. In other emergencies, the team notifies the Fire Department to respond with only the necessary apparatus. This method provides the best service for Goddard, reduces unnecessary media attention, and allows the Fire Department better to use its resources.

The GERT was born after gaining support of both the Center's management and Prince Georges County. Standard Operating Procedures (SOP's) were written and approved by Center management, including Center Director Dr. Townsend. The County approved a request to allow the GERT to operate on Fire Department radio frequencies. The GERT then obtained the equipment necessary to perform their operations. The Branch's safety van was outfitted as the Team's emergency vehicle and operations were initiated.

Because the GERT members are trained to the level of Fire Department officers and are familiar with Goddard's operations, they become the incident commander for Goddard during emergencies. The Fire Department recognizes the Team members' training level and expertise and, therefore, treats the GERT as a valuable resource.

When Goddard's NASCOM management found out about the GERT, they

Mobile VLBI Units Measure Movement from California Earthquake

by Randee Exler

Preliminary analysis of crustal motion measurements taken at Fort Ord, CA, by mobile Very Long Baseline Interferometry (VLBI) systems immediately following the California Bay Area earthquake show episodic (abrupt) movement of five centimeters, according to VLBI Systems Manager Tom Clark, Code 621. This figure is slightly less than the eight centimeters change predicted by scientists.

The measurements, taken immediately after the quake by mobile VLBI systems are a special set in the series of California measurements taken by Goddard's Crustal Dynamics Project (CDP) and the National Oceanic and Atmospheric Administration's National Geodetic Survey (NGS) to monitor motions at selected sites along the San Andreas fault. These agencies have been taking California measurements since 1972.

The VLBI technique was derived from radio astronomy: several radio telescopes make simultaneous observations of weak radio signals originating from quasars billions of light-years from Earth. Sophisticated electronics allows the timing of these signals to about 30 picoseconds — the length of time it takes radio waves to travel one centimenter

A number of these precise measurements are taken over one day at several stations, and are combined to produce measurements of the site positions accurate to about 1 cm.

In addition to large fixed radio telescopes around the world the CDP and NGS operate two mobile VLBI systems, each consisting of two trailers and a dish antenna. The CDP and NGS deployed these two systems to several Bay Area sites immediately after the earthquake.

By October 20, the system called MV-2 was on the air at the Presidio, near San Francisco's Golden Gate Bridge. Over the past several years, VLBI measurements have shown the Presidio to be moving northwestward at 32 millimeters per year with respect to the interior of the United States, according to Clark. Preliminary analysis of the crustal motion measurements taken indicate no movement greater than two centimeters as a result of the October 17 California earthquake.

By October 22, the second mobile VLBI system, MV-3, was operating at Fort Ord,

World-Wide

requested special 24-hour coverage during shuttle launches. Several flight projects have requested GERT participation for potentially hazardous operations or tests, including the two-phase heat transfer project for Space Station Freedom.

Although the team is new to Goddard, the members are not new to the emergency services. The three first met while they were volunteer EMT's on the Texas A&M Emergency Care Team. Texas A&M University's emergency medical service is provided by this student-run volunteer service. Each had previous volunteer experience before coming to Texas A&M. Because Texas A&M was the only university to offer a Safety Engineering Degree, the three knew that they would work in similar jobs, but they couldn't have known that they would all work together.

As each came to Goddard, they joined the Laurel Volunteer Rescue Squad. They each still stand a 12-hour ambulance shift weekly. In September, they were presented with the Goddard Community Service Award for their volunteer work.

The GERT has had a busy first year, responding to more than 50 calls for assistance. Next year promises to be even busier for the GERT as members of the Goddard community realize the resource that is available.

about 50 km south of the earthquake's epicenter. Previous VLBI measurements had shown Fort Ord to be moving with nearly the full rate of the Pacific plate (46 millimeters per year).

The MV-3 system operated at Fort Ord in an attempt to monitor post-seismic creep through mid-November. The MV-2 system made observations at several other northern California sites, before returning to the Presidio.

The mobile VLBI units were developed by NASA and are operated for the Office of Space Science and Applications through Goddard's Crustal Dynamics Project and NOAA's Climate and Global Change Program by the National Geodetic Survey Division of NOAA.

Goddard Amateur Radio Club Performs Invaluable Service During Hurricane Hugo

by Randee Exler

When Hurricane Hugo swept through the Caribbean, snuffing out communication lines during its course of destruction, Goddard amateur radio operators took to the airwaves, providing a vital link between people on the storm-struck islands and the information-starved public on the mainland.

"We played a significant role," explained Goddard Amateur Radio Club (GARC) President Chuck Sommer, a Bendix Field Engineering Corporation employee contracted to Code 542.2. "No one knew how much damage had occurred for several days but we were able to receive a first-hand report and pass this information on to the public."

The GARC trailer on Soil Conservation Road was filled with dissonant sounds on Monday, September 18, when club members began monitoring the first emergency radio transmissions originating from the Caribbean. Telephones rang constantly. The high-pitched whine and scratch noises of operators tuning-in radio stations intermingled with voices trying to connect with operators on the hurricane-hit islands.

The first messages came from St. Croix and the outer islands. By Tuesday, September 19, reports were coming in from Puerto Rico.

"We could tell that the damage was quite severe because the information flow was so slow," Sommer said. All normal means of communication were down. Radio operators relied on emergency generators and batteries to transmit; power had to be conserved. Until a semblance of order was restored, island operators only relayed messages out; health and welfare messages were not accepted until Wednesday, September 20.

GARC Member Bob Zimmerman, Code 723.3, had a vested interest in these emergency transmissions. He learned on Tuesday, September 19, that the region of Puerto Rico where his mother-in-law lived was not severely damaged. Without the use of a ham radio, he and his wife may have waited days for this information.

Frantic people called the trailer trying to learn anything about their family, friends and homes. "The phone never stopped," Sommer recalled. "We kept a notebook about the conditions in different areas so when someone would call, we could tell them what we knew."

Outside the trailer, the parking lot was filled with television trucks complete with satellite dishes high in the sky. The local tv stations filed reports from Goddard relying on the club to update the Baltimore/Washington area with information available through no other source. Even the American Red Cross and the U.S. Department of State began referring calls to the Goddard hams. When the Navy could not reach its Roosevelt Roads base in Puerto Rico, Sommer was asked to try to raise the station.

More than 25 health and welfare calls were made before the club ended its hurricane vigil on Saturday, September 23.

The GARC is best known for its rebroadcasts of live voice communications from the space shuttle. This service reaches hams and shortwave listeners around the globe.

For GARC Vice President Vicki Gigante-Hueber and GARC Member John Hueber, a Computer Sciences Corporation employee contracted to Code 440.9, the club is a family affair. You might call their son, Victor, GARC's youngest member. During the long hours spent in the trailer, this three-year-old could be found pretending that he was transmitting to some undisclosed location.

"We've been bringing Victor here since he was born," Vicki explained. "He thinks that his is his radio station!"

PHOTO D. McCALLUM

ZIMMERMAN, HUEBER, MILROY, GIGANTE-HUEBER

INSIDE

Center Director Speaks On The Future of Goddard

As we move into the decade of the nineties, Goddard will continue to be faced with challenges and will play a major role in the beginning of a new era in space and earth explorations.

GN recently interviewed Center Director Dr. John W. Townsend, Jr., on the future of Goddard in a changing environment.

GN: Do you have a personal "vision" for the future of Goddard?

JWT: Goddard's strength has always been in its diversity. My vision is to continue to encourage this diversity throughout the coming decade. Goddard will never be a "one or two project" center.

GN: What do you see as "key" future projects for GSFC?

JWT: No group of projects can define Goddard, but I basically have three key objectives: 1) to maintain Goddard's world class research in space science; 2) to start up a major Earth science initiative, the Earth Observing System; 3) and continue to provide quality technical and support functions for these programs. Although we will grow in numbers and funding, I see no fundamental changes in Goddard's direction for the future.

GN: Do you think the contractor/civil servant ratio will increase or decrease in the future, and what impact to Goddard will result?

JWT: I think that even though the overall number of personnel will increase, the ratio will stay the same. I think Goddard has contracted out as much as is prudent, and we won't be forced to go beyond that.

GN: How do you think long-term construction of new facilities, such as the planned facilities across Soil Conservation Road, will affect GSFC?

JWT: I think it will have a positive effect in that we'll finally have enough space to house all our people, plus the new people in Earth science. By about fiscal year '92 we'll have to increase our civil servant manpower to 4,000 people (from about 3,700 now), and without major construction we won't be able to house them all. One problem I'm considering is how to get to and from new facilities across Soil Conservation Road. I have four options right now: 1) install a traffic light; 2) build a bridge over the road; 3) build a tunnel under the road; and 4) close Soil Conservation Road entirely, which is an option, because it's owned by GSFC and the Agricultural Center. Politically, this might be very difficult, however.

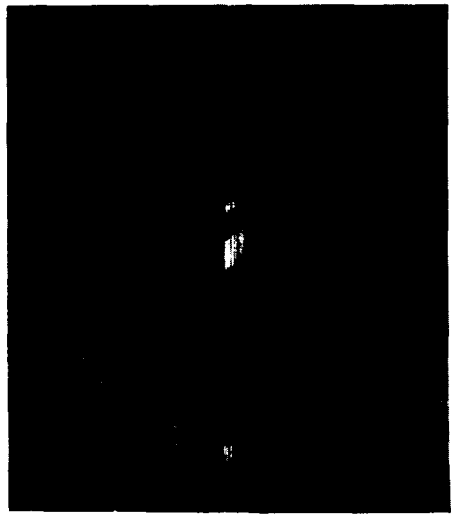


PHOTO: D. McCALLUM

TOWNSEND

GN: How would you improve the quality of life at Goddard, if funding were limitless?

JWT: The number one problem I would address is the issue of inner space. We're very short on inner space at Goddard. I would build new buildings, and refurbish the ones we have. I would build more parking spaces and another cafeteria—which, obviously, we'll also need when the new buildings are built across the street. We'll also need more auditorium space in the new buildings.

GN: How can we make up for the loss to Goddard in experience and personnel resulting from the departure of the many outstanding scientists, engineers, and managers who are now retiring or going somewhere else? And how can we bridge the generation gap between those experienced personnel who are still around, and the fresh-outs coming in with no experience, when there are no mid-level people to mediate?

JWT: This is a very serious problem which has affected Goddard, though not as badly as it could have. We've been hurt, but not mortally wounded. So far we've been able to fill key jobs with experienced people. In some cases, we've called people back from retirement to help out on a short term basis. The major factor is that the government has gotten too far out of whack with the private sector in salary levels, especially for the middle and top range. It is essential to pay people commensurate with their work and what they can get on the outside. Congress is addressing that problem, and we should be able to increase some salaries to come close to private industry. Our job then is to minimize the difference, and emphasize the other job factors. For example, working here is **fun;** sure, there are sacrifices, but challenging work can help counter that. Young people hired at Goddard are given more responsibility for their age than they could get on the outside. We have to try and create a bridge between generations, with a "lessons learned" approach to try to keep from repeating the same mistakes.

GN: How will Goddard do if the Gramm-Rudman-Hollings enforced budget cuts go into effect?

JWT: We don't know. Even my boss hasn't answered that! There are different scenarios based on different implementations of the cut—but all are nasty scenarios, some with dire consequences. Gramm-Rudman-Hollings may go into full effect for a whole year, we may have it for two months, or only the first quarter of the year. Each has a different answer, but everything suffers under such cuts. Research & Development (R&D) is affected. The Resource & Program Management (R&PM) money, which provides salaries, travel, and necessary services like power, fuel, and security, is affected. The Construction of Facilities (C of F) will be affected, and even our TDRS (Tracking and Data Relay Satellite) accounts will be affected.

GN: What are you doing about parking? With the proliferation of trailers in parking lots, there's getting to be less and less space for employee parking.

JWT: We are building new lots. Some work going on right now appears to be taking away parking lots, but it's all part of a master plan that will ultimately increase parking. We are not really losing parking space. One factor, of course is that more contractors on-site means more cars.

GN: What will GSFC's role be in the Scout-class expendable launch vehicle program?

JWT: We're taking it over from Langley, and Goddard will now buy "launch services" from a contractor for small "Scout"-class expendable launch vehicles. There are still a few government Scouts, but the new contract will for services.

GN: One reliable source within NASA has said that there is a possibility that GSFC may be consolidated with another NASA center. Is that a viable possibility? If so, when would it likely happen?

JWT: No way—it wouldn't work!

See "Special Challenges for GSFC" and "The One Thing I Would Change at NASA" when "Center Director Speaks" is continued next issue, January 1990.

CLOSE-UP

Congratulations to **THOMAS F. WILLIAMS** (Code 405), Goddard's new Deputy Project Manager for the Tracking and Data Relay Satellite System. Formerly TDRS Systems Manager, Williams replaces Charles Hunter. "Our next task at hand," said Williams, "is to develop the Advanced TDRS to pick up where our present system leaves off"...

WILLIAMS

BARBARA H. PUTNEY (Code 626) is the new head of the Space Geodesy Branch of the Laboratory for Extraterrestrial Physics. "With space geodesy, we use satellites and space to measure things on the Earth—or Mars—such as gravitational fields, tides, and polar motion," said Putney...

PUTNEY

The new Head of Goddard's Electronics and Computer Development Section (Code 745.2) of the Attitude Control and Stabilization Branch is **RICHARD SCHNURR,** formerly of the Components and Engineering Section. "Our section develops attitude control hardware for the Spartan [a Shuttle-deployed free-flying payload], and for the upcoming series of small Explorer missions," said Schnurr. "Currently we're working on the attitude control system for SAMPEX, the first of the Small Explorer missions."

SCHNURR

Goddard Engineer Receives Moe I. Schneebaum Award

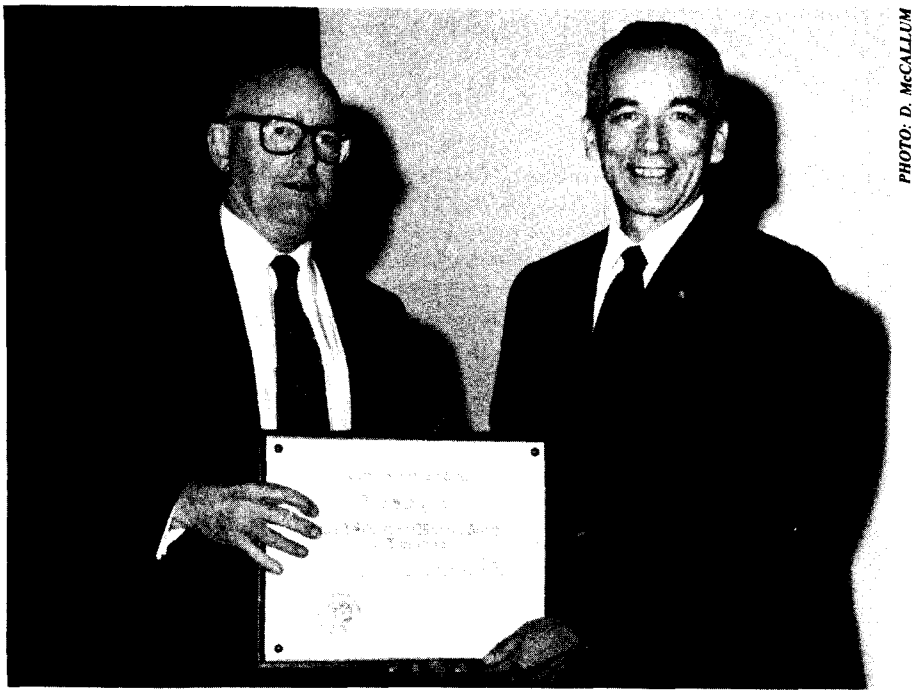


PHOTO: D. McCALLUM

TOWNSEND, SUDEY

JOHN SUDEY, JR., of the Electromechanical Branch of the Space Technology Division (Code 716.2), is the 1989 recipient of the prestigious Moe I. Schneebaum Memorial Award.

Center Director Dr. John W. Townsend, Jr. presented the award in front of a full house in the Building 3 Auditorium on Monday, November 13, followed by a reception in the Building 3 lobby.

Sudey received the award for his significant contributions in the field of microphonics measurement and compensation for advanced spacecraft programs, specifically the Cosmic Background Explorer (COBE) and the Hubble Space Telescope (HST). Sudey's contribution to the development of the COBE FIRAS Mirror Transport Mechanism (MTM) was outstanding, according to Goddard officials. He planned and directed baseline tests to measure structural transmissibilities to the MTM from all sources, assuring that they were recorded, analyzed, and understood. He designed circuitry to compensate for the disturbances, where necessary. The MTM now exceeds all microphonics stability goals.

Sudey is Goddard's leading authority in the field of analyzing and correcting the effects of dynamic disturbances on flight instrument control systems.

Dr. Peter M. Banks, Engineering Professor at Stanford University, delivered the Moe I. Schneebaum Memorial lecture, on "Soviets in Space," during which he described and analyzed the Soviet space program, and compared Soviet launch vehicles to vehicles used by the U.S. and Europe.

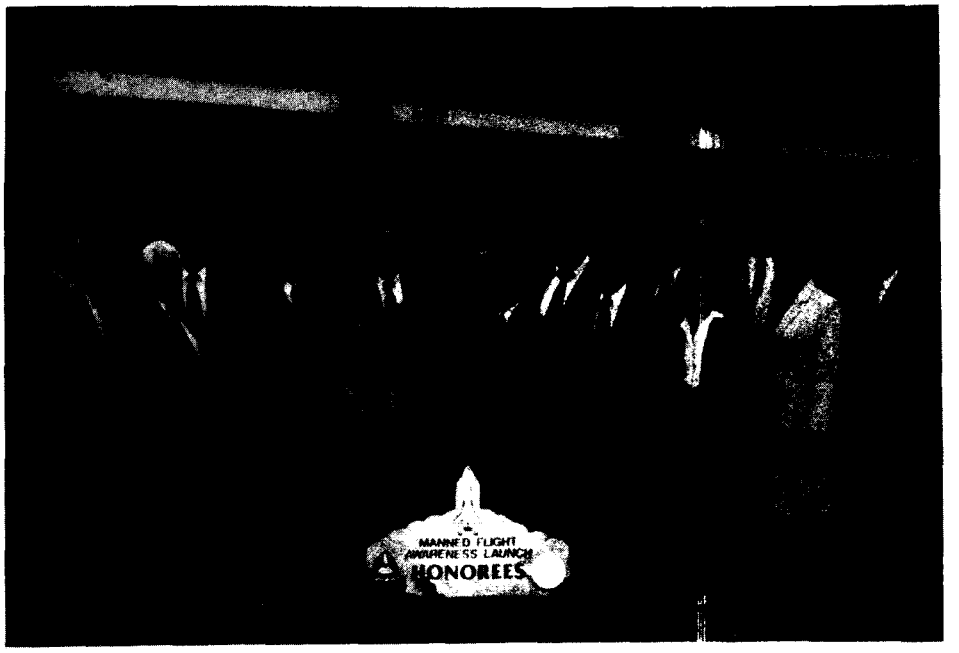
Retirees

Congratulations to the following Goddard employees who recently retired!

Name	Code	Years	Name	Code	Years
Allen, Curtis R.	831.2	35	Gunton, Ronald R.	480	33
Arman, Ali	750.2	32	Lott, Robert D.	615.1	23
Browning, Ronald K.	400.6	32	Washington, George	290	30
Cudmore, Patrick H.	740.1	37			

Goddard Honorees Visit KSC

As part of the Manned Flight Awareness Program, seventeen Goddard Space Flight Center honorees were recently rewarded with a trip to the Kennedy Space Center (KSC). In addition to an astronaut/honoree reception, they received a VIP tour of KSC, witnessed the Astronauts Memorial Foundation groundbreaking ceremony, participated in a mini Space Camp, and visited the Merritt Island tracking station. Astronauts Sid Gutierrez and Blaine Hammond presented certificates to the Goddard honorees.



HONOREES—Pictured left to right: Glenn Stewart, Code 285; Wilbur Grant, Bendix Field Engineering Corp. (BFEC); David Manion, Computer Sciences Corp. (CSC); Jenny Glenn, EER; Scott Greatorex, Code 554; Jean Carlson, CSC; Robert Stelmaszek, Code 533; JoAnn Sidotti, BFEC; Donald Molgaard, TRW; Rao Amaraneni, BFEC; Donald Mason, BFEC; Sat Pal Singhal, CSC; Michael Miller, Fairchild Space Co.; Madeline Butler, Code 502; Craig Tooley, Code 745; Patricia Ratkewicz, Code 130; and Guy Cordier, Ford Aerospace Corp.

NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

Goddard News

The GODDARD NEWS is published monthly by the Office of Public Affairs, Goddard Space Flight Center, Greenbelt, MD 20771.

Deadline for submitted material is the first of each month. For additional information, contact Code 130, 286-8956.
The GODDARD NEWS staff is:

Executive Editor
Jim Elliott
Managing Editor
Carolynne White
Editorial/Production Advisor
Randee Exler
Senior Editors
Michael Braukus, Carter Dove, and Joyce Milline
Editorial Assistant
Monica Johns on

Goddard Closes Tracking Station at Hawaii

Goddard's tracking station at Hawaii, long a part of the Space Tracking and Data Network (STDN), performed its last support of the network on September 29, and was officially closed on September 30th. The station will continue to operate a few elements through Code 600 (Space and Earth Sciences Directorate), including crustal dynamics; very long baseline interferometry; and the Interplanetary Monitoring Platform (Imp-8); and will continue to support GOES-3 (Geostationary Observational Environmental Satellite) for the state of Hawaii.

The tracking station at Hawaii opened with instruction of personnel in May 1960, and the station provided its first support in September 1961. The station closes after 29 years of successful support of manned and unmanned flight projects, including the Apollo 11 Lunar Landing on July 20, 1969. Fidel Rul was the station director at Hawaii for four years, from 1979 to 1983. Here is his farewell to the personnel at the Hawaii tracking station.

Aloha Hawaii Tracking Station:

As a former station director of Hawaii, I welcome the opportunity to express my sincere appreciation and pay tribute to one of my favorite places in the NASA community. The Hawaii Tracking Station has been one of the key supporting facilities of NASA's Global Network, contributing to the highly successful manned and unmanned space flights. Every individual who has been part of the Kauai Team has every reason to stand tall and be extremely proud of their role and contributions to our national space programs which have yielded thousands of benefits to the peoples of the world....

I congratulate you for being part of a history-making endeavor for more than a quarter of a century, for your commitment and dedication, and for your personal sacrifices. "One small step for a man" was made possible by each and everyone of you, and the steps taken in the future, will be because of you.

Again, my heartfelt thanks and appreciation for all you have done in the past, and may you continue to enjoy many successes in the future.

Adios, Aloha and God Bless You.

Fidel R. Rul, Jr.