

Congratulations SAMPEX Team!

NASA

National Aeronautics and
Space Administration

Goddard Space Flight Center

Goddard News

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Governor Presents Center With Economic Impact Study



Photo: J. Semeraro

Goddard Director of Engineering Tom Huber, left, briefed Maryland Governor William Donald Schaefer, right, on spacecraft testing and evaluation. Huber explains a vacuum chamber to the governor.



Department of Economic and Employment Development Secretary Mark Wasserman, left, accompanied Governor William Donald Schaefer, center, on his visit to Goddard. DEED prepared a study on the economic impact of GSFC in Maryland that the governor presented to Center Director John Klineberg, right.

Goddard has an annual economic impact in Maryland of \$2.1 billion in gross sales, \$904 million in employee income and 26,690 full-time equivalent jobs in businesses throughout the state, according to a Department of Economic and Employee Development (DEED) study that was presented to Center Director Dr. John Klineberg by Maryland Governor William Donald Schaefer when the governor toured Goddard June 23.

The governor's tour included an overview of Goddard's spacecraft testing and evaluation facilities and briefings on topics such as Mission to Planet Earth and the Hubble Space Telescope Servicing Mission. He also was briefed by Laurel High School students participating in the Cooperative Satellite Learning Project on the Solar, Anomalous and Magnetospheric Particle Explorer (SAMPEX) and met with members of the Goddard Contractors' Association.

The study, prepared by DEED's Office of Research, concluded that every \$1 million in Goddard expenditures generates an additional \$2 million in total gross sales, \$841 in employee income, about 25 full-time equivalent jobs in Maryland companies and more than \$58,000 in selected state and local tax revenue.

"Goddard is a very important part of Maryland's

economy, in addition to being a leader in space science," said Governor Schaefer. "Goddard also has been a good neighbor, working closely with Maryland's high school and college students and giving them an opportunity to develop scientific experiments which are carried out in space."

"We are very pleased with the results of this study, which demonstrates once again that Goddard is an important and significant part of the state of Maryland," responded Center Director Dr. John Klineberg."

Directors' Dialogue



Q. What is currently being done about buying recycled products for Goddard? In the bathrooms I see the toilet paper and hand towels that are made out of recycled paper, so why isn't the rest of the base making the same effort as [Plant Operations and Management Division] POMD to use recycled products? As a government facility, I would expect Goddard to be a major consumer of recycled products, including everything from computer paper to toner cartridges, to using recycled paper for books put out by Goddard. Also, is there a program that recycles used binders and other items back into supplies?

A. Our Plant Operations and Maintenance Operations at both Greenbelt and Wallops are supplying toilet tissue and hand towels that are made from recycled paper. Code 290 is also the manager for

the Center's office paper recycling program.

We are interested in having as many recycled items as possible in our stores stock program. In support of this we recently reissued the "Recycled Materials Section" of our Greenbelt Stores Stock Catalog which contains more than 250 items available from stores stock that contain recycled material. If you would like to receive a copy of the Recycled Materials Section, contact the Code 239 Customer Service Office, at x6-8900.

At this time we do not plan to begin a recycled toner cartridge program. Our past analysis shows that the program requirements would be unwieldy because of the cost and administrative workload (both to our customers and our contractor) that would be needed to administer a return program. While there is no Centerwide recycled

toner cartridge program, there is help for individuals. For more information contact Michele Garrett of the Small Purchases Branch, Code 248 on x6-4915.

Our Small Purchases Branch does not as a rule look to procure recycled products. However, if an individual requests a recycled product or a recycling service, they will work to comply with the individual wishes. If your organization has excess binders, contact our property disposal technician, Joyce Brooks, at x6-5912.

The type of paper used for publications is controlled by the U.S. Government Printing Office. All cover materials for publications are made from recycled materials. By the end of this year almost all of the paper used for publications will have recycled material in them.

**Sherry Foster, Director
Management Operations Directorate
Code 200**

Questions for Directors' Dialogue may be sent in to Directors' Dialogue, Code 130, without identification. Questions are sent to the appropriate directorate office as written, but may be edited for space and clarity before being printed.

EOS Undergoes Reorganization

by Jim Elliott

The Earth Observing System (EOS) project at Goddard has been reorganized to meet the needs of the recent program restructuring and the addition of Landsat 7 responsibilities, according to Jerry Madden, Associate Director of Flight Projects for EOS.

Under the reorganization, effective May 31, EOS adds two new projects and changes the names of three others, Madden explained.

The new projects are the EOS Chemistry and Special Flights Project and Earth Science Mission Operations, Madden said. The Chemistry and Special Flights Project is headed by Arlene Peterson, formerly Deputy Project Manager with the former EOS

Observatory Project. The Earth Science Mission Operations Project is led by Charles "Chuck" Trevaathan, Project Manager for the Upper Atmosphere Research Satellite (UARS) Project. Trevaathan retains his UARS title and responsibility, Madden explained, because the new project will serve as the "operational wing" of EOS with UARS, Landsat and other satellites coming under its responsibility.

NASA was given responsibility for the ground segment, data processing and flight operations of Landsat 7 recently. The U.S. Air Force was given responsibility for the spacecraft segment. Currently, Landsat responsibilities rest with EOSAT, a commercial operation. Two Landsat satellites—Landsat 4 and 5—are in orbit, and Landsat 6 is scheduled for launch January 23,

1993. The targeted launch date for Landsat 7 is mid- to late-1997, according to project officials.

The three projects undergoing a name change are the EOS Observatory Project, which becomes the EOS AM Project; the EOS Instruments Project, which becomes the EOS PM Project, and the Earth Observing System Data and Information System (EOSDIS), which becomes the Earth Science Data and Information System (ESDIS). All three projects which had their names changed retain the project managers: Christopher Scolese heads the EOS AM team; Martin Donohoe leads the EOS PM team, and John Dalton directs the ESDIS group.

Originally, the EOS program was designed to launch two series of three unmanned spacecraft

(continued on page 8)

New Projects:

- **EOS Chemistry and Special Flights Project**
- **Earth Science Mission Operations**

Blue and Red Teams Work for a Bright NASA Future

by Susie Marucci

Since NASA Administrator Daniel Goldin took office in April, one of his themes has been improvement in projects, timeliness and costs. On June 5, Administrator Goldin sent out a memo describing how his vision for the future should unfold. He said he wants it to be a shared future, with input from NASA and the American people. Goldin also created sixteen Blue and Red Teams. Their purpose is to review NASA's major programs currently in existence and make recommendations for the future. The ten Blue Teams will review programs and the six Red Teams will review the Blue Teams' work and make sure alternatives are considered.

"I have chartered a Vision Team to develop an initial draft of a vision statement for NASA. That statement will briefly describe NASA's "purpose in life" — what we see as our role in American society....In addition, the Team will develop values for NASA workers

and for NASA as an institution," the memo stated. A draft of the Vision, Mission and Values Statement was sent to employees with a request for their comments in mid-June.

Goldin said, "To allow the most fruitful and creative inputs, we have established Red and Blue Teams and empowered them to reexamine every program....The object of these reviews is to explore options and techniques to improve the way we do business." He also noted that the teams are looking for ways to make significant savings. Goldin stressed he was not looking for across-the-board cuts. He also noted that the team suggestions will have a thorough evaluation before any of them are put into practice. Goldin also stated, "the end result will not be my vision for NASA, but our vision for NASA."

GODDARD BLUE TEAMS

TDRS II — Phillip E. Liebrecht, Code 530, chairman; Madeline J. Butler, Code 560.1;

Kate R. Hartman, Code 553; Robert Jenkins, Code 712.4; Margaret Luce, Code 731.1; Marco A. Toral, Code 405. **EOS** — Chris Scolese, Code 421, chairman; Marty Donohoe, Code 422; John Dalton, Code 520; Arlene Peterson, Code 422. **Ex Officio** — Dick Austin, Code 420; Pam McInerney, Code 284.4; Bruce Guenther, Code 920.1.

GODDARD RED TEAMS

Robotic Exploration of the Solar System and Universe — Peter Burr, Code 100, chairman; Susan Breon, Code 713.1, vice chair; Robert Martin, Code 515.1; Allan Sherman, Code 700; Richard Tagler, Code 500. **Human Presence in Space** — Mary Cleave, Code 970.2. **Remote Sensing and Environmental Monitoring of Planet Earth** — Bill Barnes, Code 970.

VISION TEAM MEMBERSHIP

David G. Cleveland, Code 310; Dorothy J. Pennington, Code 490; David E. Smith, Code 920.

What's UP?

July 1, 1992

UARS — *Days in Orbit:* 291

Interesting Fact: The solar array remains in a "parked" condition after it had difficulty rotating and was unable to track the Sun properly. Tests of the solar array drive system indicate that the "A" drive clutch cannot be placed in neutral. Options for solar array operations are under study.

COMPTON — *Days in Orbit:* 452

Interesting Fact: On June 30, 1992, Discover Magazine named the Compton Observatory a finalist for the Discover Awards for Technological Innovation. Compton will be featured along with the other finalists in the magazine's October issue, when the winners also will be announced.

HST — *Days in Orbit:* 737

Interesting Fact: HST researchers released a photo of a dark "X" that may mark the exact location of a black hole believed to be hiding in the spiral galaxy M51.



Photo: R. Frisch

Future Goddard-Related Missions —

***LAGEOS: October 15, 1992 — STS-52**

***GAS Bridge: mid-September 1992 — STS-47**

***Launch dates subject to change**

Five astronauts from the STS-53 Discovery mission were here for a briefing on the hitchhiker project and a tour of the clean room in Building 5. Several hitchhiker experiments will fly on this mission in early November. From left, Commander David M. Walker, Mission Specialist Guion S. Bluford, Pilot Robert D. Cabana, Mission Specialist James S. Voss. Mission Specialist Michael R. U. Clifford had his back to the camera.

Dunbar Senior High School Gets a Boost from Goddard

by Susie Marucci

How can schools get and keep young people interested in math and science? This question is on the minds of a number of people these days. Education is becoming more and more important to NASA and Goddard. Because of that, Goddard employees are reaching out to students showing them the promise of space.



Photos: D. McCallum/J. Semeraro

Ronald Butler, left, and Raymond Lofty, right, students at Dunbar Senior High School teach kids from Henley Elementary School in Washington, D.C., about Galileo's Journey to Jupiter.

One example of this teamwork took place on June 3, when Dunbar Senior High School in Washington, D.C., held its 1992 International Space Year (ISY) Day. The program was part of its Enterprise Mission which provides a new learning environment where young people can reach their potential and gain math and science skills using space and space-related missions as the "hook."

In addition to students and teachers at Dunbar, special guests included NASA Administrator Daniel Goldin and six of the seven crew members of the STS-45 mission. Goldin was the keynote speaker. He took a tour of the displays set up at Dunbar and remarked that several students had given him some good ideas about how to fix the antenna on Galileo. Charles Bolden, Commander of the Space Shuttle Atlantis on the STS-45 flight, advised the young people to work very hard. He also joked with the students saying he hoped one day some of them would join, but not replace, him and the other astronauts present.

One of the highlights of the visit was the United Space Ship (USS) Dunbar, an area transformed into a workroom and exhibit area about space. Inside the spaceship/classroom were Advanced Picture Transmission computers from Goddard, provided by Charles Vermillion, Code 930.8, and his team in the International Data Systems Office, so students can learn about satellites and weather. Other displays included Mars, planetary exploration, Magellan's exploration of Venus, Galileo's

exploration of Jupiter, planetary comparisons and information about countries with space programs. Students briefed the STS-45 crew and Goldin about these exhibits.

Later in the day, awards were presented to 13 individuals and corporations for their outstanding contributions to the program. Charles Boyle, Code 900, environmental education manager for the Earth Sciences Directorate, received the Dunbar Pre-Engineering award. Working as a volunteer, Boyle has been project advisor to the Enterprise Mission for three years. According to Dr. Eva Rousseau, principal of Dunbar, Boyle's "personal and professional commitment to helping the program attain its greatest potential for educating young people is exemplary. He has provided, and encouraged others to provide, counsel and resources that continue to enhance the academic environment."

Scientists from NASA headquarters and Goddard periodically act as mentors for Dunbar students. Then, students from Dunbar pass on the knowledge they have learned by mentoring students at Henley Elementary, Washington, D.C.

Continuing a Commitment to Excellence

Engineering Director Tom Huber likes to call it "using some of that old-fashioned common sense." Deputy Director Peter Burr quips "...people at Goddard are involved in it and have been for some time." Management Operations Director Sherry Foster says "...it's not easy, nor quick, but there will be continuing benefits that will affect all of us." The "it" refers to process management and improvement, the same principles found in Total Quality Management or Continuous Improvement (CI).

At a recent retreat, the members of the Executive Council were led through a series of exercises on "GSFC: Continuous Improvement"

by John Whitlock and Bill Dunnington from Organizational Dynamics Incorporated. The formal training brought out flip charts, colored markers, masking tape, creativity and thoughtfulness and led to a carefully measured commitment by Goddard's Executive Council that process management and improvement should be a way of life at Goddard in concert with the Center's strategic plan. Charts titled: Road Maps, Expectations, Challenges, Basics, Blueprint, and Next Steps filled the blank white walls of the meeting room as the session continued.

One model explored begins with a top management that gives direc-

tion and defines vision, mission and values based on careful consideration of information from customers, employees and others. Also in the model is a multi-step process improvement scheme that becomes the heart of problem solving and continuous improvement and that relies on all employees' participation. About half of the elements of this model emphasize "defining the right things to do," and the other half, "doing the things [as defined] right."

This and other models are based on five fundamentals: customer focus, total involvement by employees at all levels, measuring change and progress, systematic support and continuous improvement.

Scientific Visualization: The Wave of the Future

by Susie Marucci

At first glance, the large monitor looks like it is showing some interesting animation for a film festival. Actually, the images are the product of a new field called scientific visualization. It uses state-of-the-art computer graphics to translate data from spacecraft or other scientific instruments into a two- or three-dimensional computer space. Mathematical models of scientific phenomena can also be translated into animation.

Often, the best way to get the maximum information from data is by viewing a sequence of images in the form of animation. Using computer graphics techniques, the points in the computer space can be converted into surfaces or volumes which can be viewed as images from any point by a "camera" moving inside the space. The surfaces or volumes can be manipulated according to color, brightness, texture, transparency and position to show the data in the most accurate and useful ways possible.

All of this work is being done in a little known part of Goddard called the Scientific Visualization Studio (SVS), part of the Scientific Applications Visualization Facility, Code 932. Members of the SVS work with scientists to create often complex images of their data and to provide animations of the data sets for better viewing or to observe changes.

Dr. Jim Strong, Code 936, who coordinates work in the SVS, said that not only can they generate visual representations of data from spacecraft looking at Earth, but also they can generate representations from spacecraft looking at the Sun or looking anywhere in the Universe. One of the projects they have done is a three-dimensional view of the Crab Nebula in which exploding matter from the nova is seen. Dave Pape, Code 935, arranged 28 multi-spectral images of the nebula in a three dimensional stack in the computer space. By treating the data as three dimensional and applying some computer graphics techniques, Pape was able to make the exploding shells of particles visible. Because the images can be manipulated, the three-dimensional Crab Nebula also could be seen from the front, side or any other point in space.

One of the tasks of the SVS is to add "dimensions" to the data to make analysis easier. John Cavallo, Hughes STX, who often works with the scientists, said that they often have to work with these added dimension to see how the images turn out.

Sometimes, a scientist has already created a sequence of images that he would like to view as animation. This was the first task of the group that became the

SVS. Dr. Alan McConnell, Pixel Analysis, has been aiding scientists in making animations since 1987. McConnell believes that scientific visualization is presently in its infancy and that it will soon be the standard way of viewing data.



The SVS is staffed by six people. In addition to Strong, Pape, McConnell and Cavallo, there is Dan Jacob, NYMA, who keeps the equipment running and communicating and Cindy Starr, Sterling Software, who is developing new modules for a computer graphics software package. Together they bring the world of data to scientists in three dimensions and living color.

Dave Pape, Code 935, works at his station in the Scientific Visualization Studio. The images on both screens were created using scientific visualization.

The Goddard Contractors' Association: The First Year

by Richard Backe, Paramax Corp, Goddard Contractors' Association chairperson

In May 1991, Goddard Center Director Dr. John Klineberg saw the need for an improved means of communication with the Goddard contractor community. He selected a group of 19 companies that each had more than 100 resident Goddard employees and several others with major hardware contracts. This group was chartered as the Goddard Contractors' Association (GCA) and began monthly meetings with Klineberg.

In a year-end report to Klineberg, the initiative was labelled as an unqualified success. In monthly meetings with the Center director and his staff, GCA has received reports on budget and personnel issues, safety and space problems, project developments and special events. GCA surveyed its members and reported their views on Award Fee Contracting and the NASA and GSFC Excellence Award process.

Association members shared their knowledge of Total Quality

Management (TQM), or Continuous Improvement, as it is known at Goddard. GCA was a major participant in the TQM symposia run by Goddard at Turf Valley Country Club, Ellicott City, Md., in October 1991 and at Goddard in April of this year. Representatives were also key contributors to the Center's TQM Working Group which helped Goddard's Executive Council draft the Center's formal Continuous Improvement plan adopted this spring.

Michael Rowe: Making Sure the Machine Runs Smoothly

by John J. Loughlin II

As he walks through the inner recesses of Building 4, the neatly dressed man wearing a trendy floral tie, looks somewhat out of place among the men and women, all in navy blue uniforms working in the shops. As he passes an entrance to the carpentry shop, Michael Rowe begins to speak. His words are cut short by the piercing sound of a power saw. Instead of trying to compete with the din, the soft spoken Rowe pauses, smiles as if embarrassed by the machine, and as the noise dissipates, he speaks. He's not out of place at all, but instead very much at home.

he supervises, do "whatever it takes."

"When we do our job, you're not supposed to even know we are there," he said.

Cutting Through the Red Tape

Known as a manager who likes to cut through red tape to get the job done, the retired Army Lieutenant Colonel helped devise a system for POMD that all but eliminates the paperwork for repair requests.

"In the past, if you had, say a

reviewed," he said, "to make sure it meets with the long term needs of the facilities."

High Visibility

In addition to the repair and maintenance of facilities, Rowe's crew also is responsible for some rather high-visibility projects.

"When President Bush came here we got notification on Friday that all of the preparations had to be complete by Monday," he said. "Our people did just super. Many long hours were spent while we worked right through the weekend."

Another challenge faced by Rowe during the weekend's preparations was the hanging of a giant picture of planet Earth behind the president's podium. The picture measured 100 square feet (9.3 square meters) and weighed in excess of 125 pounds (56.7 kilograms).

"After we got it hung, the TV crew had us adjust it, at the last minute, so that it didn't cause glare in their pictures," he said.

The globe now hangs in Goddard's Visitor Center, in a specially built frame constructed by E.L. Hamm.

Rowe smiles as he recaps the presidential visit events.

"I can laugh about it now but at the time it was pretty nerve racking," he said. Rowe got the word on Monday, even as the secret service and the presidential advance party was arriving, that the Building 8 stage, built in the 1960s, could not accommodate the President's Director of Environmental Quality, Mr. Michael Deland, who is confined to a wheelchair.

"I'm so proud of my people," he said, "without question they actually built a wheelchair ramp literally within an hour, and the whole visit came off without a hitch."

Making Goddard run without a hitch is what Michael Rowe and his E.L. Hamm crew are all about.



Photo: J. Semeraro

Michael Rowe, right, deputy project manager for E.L. Hamm and Associates Inc., Virginia Beach, Va., lends a hand to E.L. Hamm plumber Larry Colman during renovations in the basement of Building 7.

"Ironically," he says, "most of what we do is to try to maintain a low profile."

The low profile he refers to is simply that if there is something wrong in a building at Goddard, it's Rowe's job to see that the problem is rectified, causing as little notice as possible. To make sure the work Goddard does is not affected by plumbing, electrical or heating and cooling problems, Michael Rowe, deputy project manager for E.L. Hamm and Associates Inc., Virginia Beach, Va., support contractor for Goddard's Plant Operations and Maintenance Division (POMD), and the more than 100 employees

floor tile missing in your building, you had to fill out a 16-35A work order, which is a legal size form. It's fairly time consuming to complete," he said. "Then after you got a supervisor to sign it, you had to bring it to your building Facility Operations Manager, for review and signature. Now, with this new system, all you have to do is dial x6-5555, and describe the problem."

Once E.L. Hamm gets the call, workers enter it into the computer and a work order is executed. Rowe cautions, however, that this procedure is only for repair work. "Any new construction or modification of a building, needs to be

Kudos...

The following appeared on June 15 in Bob Levey's Washington column in the Washington Post. Many have called this a fitting tribute to all that we accomplish.

"If I ran the world...Goddard Space Flight Center in Greenbelt would take a long, sweeping, collective bow. The gang there does important work and gets far too little credit."

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A Visit from Afar

Dr. Jorge Sahade, president of the Argentine National Commission for Space Activities (CONAE) visited Jerre Hartman, Code 404, International Projects manager on June 29. Sahade was accompanied by Osvaldo Marsico, a secretary at the Argentine Embassy. Sahade came to Goddard for a meeting about Scientific Applications Satellite (SAC)-B. SAC-B is a cooperative mission between Argentina and NASA for solar physics and astrophysics through the study of hard x-ray emissions from solar flares and cosmic gamma-ray burst sources. In addition to Hartman, Sahade met Charles White, Code 404, deputy project manager for International Projects and Dr. Mario Acuna, Code 695, SAC-B project scientists.

GI⁺E

On June 3, 1992, the Bloodmobile was held in the Building 8 auditorium and 217 prospective donors volunteered to donate blood. This was one of the most successful Bloodmobiles; Goddard collected 200 pints of blood! The following is a list of Goddard employees who were cited by the American Red Cross with gallon pins at the Bloodmobile.

# of Gallons	Name	Code
19	John Unger	503
6	J. Bourne	562
6	Wendy Shoan	552
4	Cathy Gormley	210
4	Steve Xander	405
3	A. Bluthe	—
3	Jeff Pedelty	936
3	John Spohr	519.1
2	J. Brady	—
2	Richard Rood	910.3
1	George Rumney	935
1	David Simpson	512.2

The next bloodmobile is scheduled for August 5 in the Building 8 auditorium. Watch *Dateline Goddard* for more details.

IN MEMORIAM

Cecile Verkaik 1940 - 1992



Cecile Verkaik, Ogden Logistics Services, Mail Operations Specialist, passed away on June 5. She had been hired in October 1989 by the previous contractor, Center Dynamic Concepts, Inc. as lead mail clerk and was promoted in April 1989.

"Cecile was well known and liked by many people on Center. Her employees had the utmost respect for her and she will be missed tremendously by all of us. It was wonderful to have known and worked with such a caring and dedicated person," explained Marian Roby, Ogden Logistics Services, Mailroom Terminal Operator.

Thomas Amacher 1933 - 1992



Thomas Amacher, Senior Vice President, NSI Technology Services Corporation, Glenn Dale, Md., and outgoing secretary of the Goddard Contractors' Association (GCA), was killed in a car accident over the July 4th weekend. Amacher was returning from a vacation in

Ocean City, Md.

Amacher began his career at Goddard in 1967 as a supervisor in Thermal Vacuum Maintenance. He joined NSI in 1971. Since 1976 he served as project manager of the Code 750 Engineering Services Division (ESD) Integration & Test Support Contract. Under his leadership, NSI supported the expanding role of the ESD on such projects as the Cosmic Background Explorer, the Extreme Ultraviolet Explorer and the Hubble Space Telescope. He became a vice president at NSI in 1988.

According to Richard Backe, chairperson of the GCA, "As the first secretary of the GCA, Amacher was a prime mover in getting the Association off the ground...His long service to Goddard, more than 25 years, was characterized by his outstanding support of many programs of the Engineering Directorate."

Goddard's Role for STS-46 is Self-Contained

by Susie Marucci

When astronauts first went into space, it was for short periods of time; getting them there and home safely were the main concerns. Today, that is still true; but with longer stays in space the condition of the hardware, be it the space shuttle, Space Station Freedom or satellites, is very important. When STS-46 launches in mid-July, Goddard will manage two secondary payloads on board, the Consortium for Materials Development in Space Complex Autonomous Payloads (CONCAP) and the Limited Duration Space Environment Candidate Materials Exposure (LDCE) payloads. These are small, Goddard-managed, self-contained payloads aboard the Space Shuttle Atlantis housed in Get Away Special canisters. These experiments deal with the effects of atomic oxygen flow, microgravity, acceleration and space-related effects found with metals and composite materials.

Field Day Helps GARC Prepares

What happens when a hurricane comes through and the power and telephones go out for days? How does the world keep up with the sit-

uation? How does the Red Cross know what to do? many groups, including the Goddard Amateur Radio Club (GARC), are prepared to help during emergencies.

To prepare for these emergencies, GARC and other amateur radio clubs and operators, participate in Field Day. This annual 24-hour event began at 2:00 p.m. on June 27 at the Visitor Center.

Field Day is a contest designed to test the ability of ham operators to communicate with as many amateur radio stations as possible under adverse conditions.

During Field Day, most GARC operators only used emergency power, such as gasoline generators, batteries and solar panels. The idea behind it is that operators just pick up their equipment and go into a field (as if in a remote location during a real emergency) and set up communications. According to Pat Kilroy,

Code 310, and a member of GARC, during this simulation of a local or national disaster, GARC members "cannot rely on television, telephones or commercial power. We have to create our own power." To get more operators involved the American Radio Relay League, which sponsors Field Day, has turned this emergency preparedness exercise into a contest.

During this Field Day, approximately 25 people participated at the Visitor Center, including 13 Goddard employees, contractors and retirees. Radio contacts were made continuously throughout the 24 hours of the contest. More than 1,000 radio contacts were made with other stations participating in Field Day throughout the U.S. and Canada. By using the Visitor Center as the location, operators were able to demonstrate amateur radio and its emergency capabilities to numerous visitors who came from as far away as Louisiana, Wisconsin and Honduras.

GARC has participated in several real emergencies, passing on information to emergency response groups. Perhaps the most dramatic example was when GARC members manned their radios on 24-hour shifts for seven days during Hurricane Hugo several years ago. The amateur operators provided emergency communications for hospitals, the U.S. Navy and the Red Cross. Earlier this year, when AT&T telephone service was disabled because of software problems, GARC provided emergency communications to hospitals and 911 dispatch services. During the San Francisco earthquake last year, GARC was on standby.



Photos: P. Gossard

Matt Kirichok, Code 541.3, a member of the Goddard Amateur Radio Club, explains about amateur radio and Field Day to some interested visitors.

When power and phones go down during an emergency, often the primary means of communication with people in the disaster area is amateur radio. Also known as "ham" radio, amateur radio is used by people all over the world, and

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The GODDARD NEWS Staff is:
Executive Editor: Rande Exler
Managing Editor: Susie Marucci

Contributing Editors: Dolores Beasley, Jessie Katz, Keith Koehler, John J. Loughlin II
Editorial Assistant: Katie Brannigan

EOS Reorganization

(continued from page 2)

equipped with remote-sensing instruments over a period of 15 years. Under a restructuring program, the missions will be carried out by multiple, smaller spacecraft. The first of these smaller spacecraft, EOS-AM, is scheduled for launch in June 1998, and it will be followed by five others through 2002. Follow-on launches are planned over the 15-year period.