Late News: TDRS-B Mission postponed - details in next issue

NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

# Goddard News

Greenbelt, Maryland and Wallops Island , Virginia

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## TDRS-B Launch Scheduled for March

*Satellite To Complement Spaceborne Tracking System*

When the Goddard-managed Tracking and Data Relay Satellite B (TDRS-B) is deployed by Space Shuttle flight STS 51- E, the giant communications satellite will help usher in a new era in the way NASA routinely communicates between ground and space.

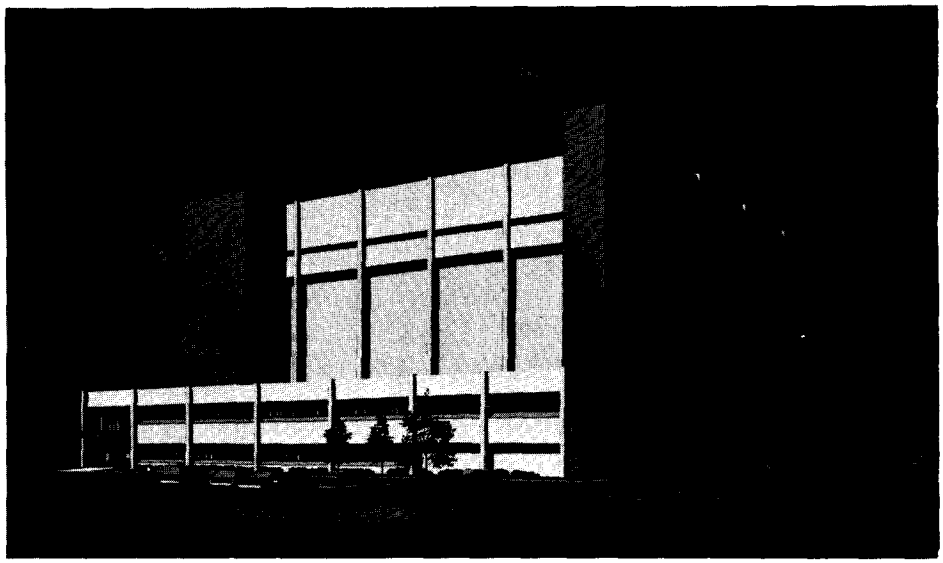
The TDRS-B, scheduled to be launched aboard the Shuttle no earlier than March 4, will be deployed into geosynchronous orbit at 35,880 kilometers (22,300 statute miles) altitude. Once in orbit, the satellite will be called TDRS-2. Positioned over the Pacific Ocean at 171 degrees west longitude, it represents the second major step toward achieving an operational three-satellite Tracking and Data Relay System which NASA has contemplated since the early 1970s. A sister satellite, TDRS-1 has been stationed over the Atlantic at 41 degrees west longitude since June 29, 1983.

The twin TDR satellites, each communicating individually with the ground terminal at White Sands, N.M., and overseen by managers at the Goddard Space Flight Center's Network Operations Control Center (Building 13), will provide communications coverage for all lower orbiting satellites as well as the Space Shuttle over 85 to 100 percent of their orbits around the Earth.

### Unprecedented Coverage

This unprecedented level of coverage will improve NASA's current Goddard-managed worldwide network of ground stations that has been used for communicating with all manned and unmanned Earth orbiting spacecraft since the inception of the space program. The ground network nominally offers coverage of space-

**Continued on page 3**



**NEW FACILITY — Above is an artist conception of a new building being considered for the Goddard Space Flight Center. President Reagan has proposed $8 million for the first construction phase of the facility, which will have the world's largest clean room.**

## *Dr. Hinners Addresses Employees*

President Reagan has proposed an $8 million expenditure in his Fiscal Year 1986 budget request to Congress for construction of a Spacecraft and Instrument Integration and Refurbishment Facility (SIIRF) at the Goddard Space Flight Center.

Plans for funding construction of the facility, which will have the world's largest clean room and take Goddard well into the next decade in the integration of shuttle payloads, were underlined February 4 in a presentation to Center employees by Center Director Noel W. Hinners.

In addition to the SIIRF, the President also has requested funds for construction of an addition to building 2, Hinners reported.

The SIIRF, which is expected to be completed by May 1988, will be an addition to the north side of building 10, according to Don W. Stanfill, head of the Planning Section in Goddard's Facilities Engineering Division. The clean room, he said, will be a class 10,000 laminar flow room 100 feet wide × 125 feet long × 90 feet high. It will have two cranes with 80 foot hook height. Another crane, capable of lifting 35 tons, will be in the shipping and receiving area.

The facility is needed to fill the requirement to integrate the larger payloads that will be carried on the shuttle on future missions.

### Congressional Approval

The $8 million requested by the President and which will need Congressional approval before the funds actually are appropriated covers the first phase of construction on the $16 million facility.

In another comment on the President's budget request, Hinners told Center personnel that the proposed "slight" reduction in NASA personnel would have only a minor impact on the Center.

Addressing more than 400 personnel at Goddard and at the Wallops Flight Facility via closed-circuit television, Hinners said Goddard "probably" would have to take a loss of perhaps 30 personnel. He said:

"We can deal with it (the personnel reduction) easily and absorb it by attrition and judicious hiring. . ."

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## *New Facility*

**Continued from page 1**

### Thrust Maintained

He also said that the new budget maintains the beneficial program thrust of the past. He explained, "There was budget pressure to accommodate the Advanced Communications Technology Satellite and one of the TDRSS (Tracking and Data Relay Satellite System) early payments".

Hinners specifically singled out the Space Station project in his presentation:

"Space Station came through in the budget process — $230 million to continue Phase B definition," he said. The amounts represent budget requests by the President. They require Congressional approval before funding can be realized.

Saying there are no new "starts" in space science for Goddard in the 1986 proposed budget, he reasoned:

"We have to think through our strategy on new starts and look downstream at the NASA and Goddard programs to see where we fit in."

In a question asked of him later, Hinners implied that the no-new-start condition had occurred in the past and was not necessarily a warning flag.

### Accomplishments Recounted

Recounting the accomplishments at Goddard during the past year, Hinners announced to his audience that it's "easy to get consumed, lose sight of what we have done." The Center Director then commented that the most important of the Goddard accomplishments in 1984 was the establishment and publication of the Center goals. Hinners added that the collaborative effort of all at Goddard "set a course, a sense of direction" to facilitate decisions and "show us where we have been."

In the first session of its type at Goddard, Hinners allowed, "Things happen at Goddard because we have good people, good leaders, good teams behind us. That to me is the most important thing we have here".

Hinners commended all Goddard Space Flight Center personnel for their effectiveness in management:

"Each", he said, is a manager of resources". He concluded by urging all to "go have fun".

# Origin Of Black History Month

## *Celebration Started As Negro History Week*

By David W. Thomas

A noted Black historian began what has evolved into the annual celebration of February as Black History Month more than half a century ago.

As founder of the Association for the Study of Afro-American Life and History (ASALH), Carter G. Woodson (1875-1950) established Negro History Week on February 7, 1926 and began celebrating that week annually. The observance eventually became Afro-American Month and, in 1976, was declared formally as Black History Month.

Woodson organized the association in Chicago on September 9, 1915. Less than a month later on October 2, the association was incorporated under the laws of the District of Columbia.

He conceived the national organization as a vehicle for promoting appreciation of the life and history of Black Americans, for encouraging an understanding of their present status and for enriching their future.

The founding of the ASALH provided reconstruction of thought based on historical truth about the African heritage of Black people, their ancient history and their contributions to the founding and welfare of America.

Joe Walters photo

**CENTER ADDRESS — Center Director Noel W. Hinners discusses the evolution of satellite technology during his talk to employees February 4. At right is an instrument scheduled to fly on a future Goddard satellite.**

This year's theme for Black History Month is: The Afro-American Family; Historical Strengths for the New Century.

Black History Month is recognized throughout many areas of the country with special radio and TV programs and supplementary sections to newspapers. In addition, schools, churches, government, businesses and various groups and organizations celebrate the event with special activities.

### State Celebration

The state of Maryland has taken major steps to preserve and exhibit its Black History. In 1984, it opened the Banneker-Douglass Museum in Annapolis. The main focus of the museum is to research and make available information regarding Maryland's Black History.

This year, Maryland is celebrating the event with special TV productions, lectures and "scholars offering researched versions of Black history." Also, a special 16-page supplement entitled "Black History in Maryland (A Black Perspective) was included in a recent issue of the Baltimore Sun.

Possibly more interesting, however, is that a Black Marylander is the co-creator of "Black Quest," a game for people who want to know more about the contributions of Black people. According to the game's creators, as reported in a local newspaper, some of the questions — because of the way they are worked — are controversial. This may cause players to do further research to verify answers, thus starting their own 'Black Quest.'

### Goddard Activities

To commemorate the event at Goddard, the Center's committee for Black History Month conducted activities on February 22. At 9:15 a.m. and 10:15 a.m. the Morgan State University Choir, Baltimore, MD performed in the building three auditorium; and from 5:00 p.m. to 1:00 a.m. a Soul Food Buffet and Disco was held in the Recreation Center.

## TDRS-B

**Continued from page 1**

craft over just 15 to 20 percent of their orbits.

"Having TDRS-2 in orbit will move NASA closer to a tracking dream we have had for years," said Dale Harris, TDRSS Project Manager at Goddard. "Putting our stations above the Earth has always been the next logical step in satellite tracking because it enables us to 'see' so much more than from on the ground. Now, after ten years of developing the technology, the dream of a fully operational system is nearing reality."

Scientists worldwide look forward to an operational TDRS System because it will provide a larger window of opportunity in space and will mean more productive future generations of satellites. To date, a major constraint on the use of satellites has been the amount of information that could be funneled back to Earth through the limited coverage of the ground network.

"With the new TDRSS," explained Peter Bracken, Goddard Director of Mission Operations and Data Systems Directorate, "we will be able to increase significantly our communication time with scientific and application satellites." For scientists and planners, he notes, that will mean greater routine access to satellite imagery both for space exploration and Earth resource studies.

### Increased Capacity

Each TDRS will be required to support the growth of satellite communications that scientists look forward to in the 1990s. The new demands will be enormous compared to past projects. For example, the amount of data to be relayed to Earth by TDRS-1 from Spacelab in November 1983 was fifty times more than that generated in the entire 24 weeks of Skylab's last mission just ten years ago. The three-satellite TDRS System therefore will have a far greater capacity than any previous system. It will be able to support up to 26 satellites simultaneously, whereas ground stations commonly could handle just one user at a time.

The in-orbit segment of the TDRSS will be completed in the Fall of 1985 with the addition of an in-orbit spare to be positioned midway between TDRS-1 and TDRS-B. An additional three TDR satellites now under construction will be maintained in storage for launch following the expected ten-year life span of each orbiting TDRS, or because of an earlier need.

The TDR satellites and their ground station at White Sands, New Mexico, are owned and operated by SPACECOM of Gaithersburg, MD. Under a ten-year agreement, NASA leases services from SPACECOM. The satellites, each weighing 2,267 kilograms (2.5 tons) and spanning 13 meters by 17 meters (45 feet by 57 feet) when fully deployed, are built by TRW, Inc. of Redondo Beach, CA.

# Goddard Phasing Out STDN Sites

By David W. Thomas

The Goddard Space Flight Center is moving ahead with the phaseout of stations in its Spaceflight Tracking and Data Network (STDN). The move comes with the advent of the new Tracking and Data Relay Satellite System (TDRSS), scheduled to become operational in October 1985.

The world-wide STDN once operated 24 stations simultaneously. Fifteen stations were supporting unmanned and manned spaceflight when the current phaseout began in 1983; only three ground stations in the current network will continue their support for Shuttle missions when TDRSS is operational.

Goddard will continue to maintain operations at Bermuda, Merritt Island, FL.; and at its Wallops Flight Facility, Wallops Island, VA. Wallops recently assumed the operational duties of the Greenbelt, MD site.

### Stations Transferred

The stations affected by the phaseout are being transferred to other agencies or to NASA's Deep Space Network (DSN), or are being completely shutdown.

The phaseout began with the closure of the Buckhorn, CA site in September 1983; other stations that have been closed under the current plan are Botswana, Africa, in October 1984; and Orroral, Australia, in December 1984.

Two stations have been transferred: Goldstone, CA, to the DSN in October 1984; and, Fairbanks, AK, to the National Oceanic and Atmospheric Administration (NOAA), also in October 1984. The Madrid, Spain site is scheduled for closure in March 1985.

### Other Closings

The Hawaiian and Ascension Island (in the South Atlantic Ocean) facilities will be transferred to the Department of Defense in October 1985. Guam; Dakar, Africa; Santiago, Chile, and Yarragadee, Australia will be closed at the same time. Yarragadee will continue operations as part of NASA's Laser Network, but will cease STDN support.

NASA's tracking system began with Minitrack.

In 1958, the agency acquired the international network of Minitrack stations that had been formed by the Naval Research Laboratory to support the International Geophysical Year. The system operated from 1958 to 1963 and later.

Minitrack was augmented with 26 and 12-m antennas in the early 1960s and became known as the Satellite Network, and remained so from 1963 to 1964.

### Data Processing Installed

In 1964, NASA installed the Satellite Telemetry Automatic Reduction system, a data processing system that significantly expanded the satellite network's capabilities. This was called the Space Tracking and Data Acquisition Network (STADAN) from 1964 to 1972.

Concurrently, the Manned Space Flight Network (MSFN), a separate tracking system for manned spaceflight, operated from 1962 to 1972.

STADAN and MSFN combined in 1972 to become STDN; the DSN, mentioned earlier, is a system designed to support deep space missions.

TDRSS will consist of three communications satellites in Earth geosynchronous orbit to provide global coverage of Earth-orbiting spacecraft, replacing the current worldwide network of ground stations.

The first TDRSS spacecraft was launched in April 1983. The second satellite is scheduled to be launched from the Shuttle on STS 51-E in March. The third TDRS is scheduled for launch no earlier than summer of 1985.

Goddard Space Flight Center scientist Mark Imhoff leads a team of woodcutters/fisherman down a river near Supoti Forest Station, Bangladesh to survey the best sites to locate radar reflectors in his experiment. (Photo: courtesy of Imhoff)

# *Imhoff Returns From Jungle*

**By Carter Dove**

If close scrapes were money, Marc Imhoff of Code 636 would be a rich man.

While the rest of NASA was comfortably (for the most part) watching and working the October 5-12, 1984 STS 41-G mission, Imhoff was up to his eyeballs in snakes, tigers, raging rivers and bandits.

The mission he had chosen took him to Bangladesh — a nation of well over 90 million people bordering on India and Burma — to set up experiment sites for the collection of extensive field data. The purpose: determine if the Space Shuttle Challenger's (STS 41-G) Shuttle Imaging Radar (SIR-B) could take pictures of land features through heavy jungle vegetation.

"The results of these experiments", Imhoff said, "were to provide insights into . . . whether or not radars penetrate vegetation." (Depending upon the degree of penetration, soil-surface features beneath the jungle cover may be delineated, we were told. An example of this would be finding areas of ponded water hidden under the tree canopy. Other results will be applied to mapping forest biomass, land cover and delineating flood boundaries for hydrological models.)

### Weighty Decisions

The mission required that Imhoff carry two large (50 lbs. each) transponders (receivers/transmitters) beginning September 12 from Goddard to Pasadena, California (for Jet Propulsion Lab verification of flight lines over the study area) and then on to Dhaka, capital of Bangladesh, via Singapore.

At Dhaka, Imhoff began the lengthy process of preparing for the jungle expedition to come: purchase and assembly of special equipment; assembly and inventory of the radar corner reflectors which would return the SIR-B signal to the Challenger, and arrangements for food, lodging and transportation to the port city of Khulna.

The British Overseas Development Administration's Sundarbans Inventory Project (BODA/SIP) played a key role: "BODA/SIP agreed to lend some boats, personnel and equipment necessary for me to carry out the ground operations in return for nominal reimbursement of fuel costs and daily per diem for their Bengali support staff", the Goddard scientist reported. (The British agency also agreed to lend all the data they were able to collect during the mission.)

Administrative details and final planning and coordination were now out of the way — for the time being. Imhoff was now days into an odyssey in which the danger was totally unknown.

"Long before I left Goddard, Chuck (Charles Vermillion, co-investigator on the SIR-B experiment and program manager of the Bangladesh project) cautioned me to be extremely careful and, to the best means possible, look after my own physical well-being before all else", Imhoff recalled.

"He knew, as well as I", he added, "that the mission had some definite rewards but probably more perils than we could anticipate."

### Thieves, Beggars and Riots

September 26, 1984. "We began the first segment of the expedition, that being the transport of the materials and personnel from Dhaka to Khulna. I supervised the loading of more than 1700 pounds of equipment onto a 93-year-old river boat at Dhaka. Loading the vehicles and boats was made ever more difficult by the presence of teeming crowds, beggars and potential thieves — all pounding on the trucks and trying to open the doors to get to our supplies". (Quote from the expedition log).

Twenty-four hours later, the boat pulled into Khulna on the then flood-swollen Ganges after delays caused by riots at several points along the way. Imhoff hired a local team at Khulna to transfer his equipment from the large river boat to small speed boats and then to the SIP launches because of the swift-flowing Ganges.

In the early morning hours of September 28 — four hours after arrival — the transfer operation was complete.

"We spent the remainder of the day pulling together the rest of the supplies needed for our trek," he explained. "This included a large amount of bamboo and local building materials for constructing the transponder towers in the jungle site."

With little ceremony, the Goddard/Bangladesh SIR-B expedition pulled away from Khulna, Bangladesh on September 29 in a fleet of 3 boats bound for Supoti Forest Station, eight hours into the Sundarbans Forest reserve near the Bay of Bengal.

### Waist Deep Water

Supoti (means "good husband" in the Bangla language) brought the mission to its sharpest focus yet: the teams set up a radio link to Dhaka, surveyed potential reflector/transponder sites and hired a local work team of woodcutters and fishermen. In all, eight corner reflector sites were established and two transponder set-ups installed. Some of the action took place in waist-deep, muddy water. In another instance, the team lost its bearing twice in the thick jungle and finally got undone by heavy rains and heat exhaustion.

October 5. The corner reflectors were in place and 35 feet high on a tree top. The

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# *Satellites Save Life of Racer*

A young Belgian race driver owes his life today to space age technology. Particularly a Goddard-developed search and rescue system which makes use of satellites for picking up distress signals.

The driver, 21-year-old Serge Goriely, suffered a fractured skull when his four-wheel-drive Citroen crashed, rolled over several times and threw him out of the vehicle in a remote area of Somalia, Africa, where there were no communications and no medical facilities.

Fortunately, a U.S. satellite—and later a Soviet satellite—picked up distress signals from an advanced, experimental radio beacon the driver had in the car. The distress signal was recorded first by the NOAA-9 weather satellite, launched last December 12 from Vandenberg AFB, CA. Later, the Soviet satellite, COSPAS 1, also picked up the signal.

The signal picked up by the American satellite was "dumped" (transmitted) at a National Oceanic and Atmospheric Administration (NOAA) ground station at Wallops Island, VA. The data then went to NOAA's facility in Suitland, MD, where it was analyzed and forwarded to the Air Force Mission Control Center at Scott Air Force Base, IL.

There, Air Force personnel notified search and rescue authorities in Toulouse, France, and French diplomats in Africa. They managed to get a doctor flown to the injured race driver, who remained in a coma for five days.

He was flown to a military hospital in Djibouti, where he was treated for two days and then flown to Brussels, Belgium, by the French Air Force. He was taken to St. Luc Hospital there.

The rescue marks the first time the advanced and still experimental 406 Mhz system has saved a life and the first time NOAA-9 accounted for a life.

Saving lives by satellite has been in development for more than two years under an international program in which the primary participants are Canada, France, the Soviet Union and the United States. The operational aspects of the U.S. part of the program, called COSPAS/SARSAT, are managed by the Department of Commerce through NOAA. The research effort for U.S. participation is conducted by the National Aeronautics and Space Administration (NASA), and NASA's Goddard Space Flight Center in Greenbelt, MD is responsible for the execution of the research.

Since the program began in September, 1982, more than 344 lives have been saved by the program.


**SEARCH AND RESCUE — Satellites save the lives of accident victims by relaying distress signals to search and rescue teams.**

## Upcoming Launches

| Vehicle | Crew | Duration | Date | Payload |
|---|---|---|---|---|
| 51-E Challenger | 6 | 4 | 3-4 | ANIK C-1 comsat/Telesat Canada TDRS-B French Echocardiograph |
| 51-D Discovery | 7 | 5 | 3-19 | LEASAT-3 comsat/Hughes Comm. Long Duration Exposure Facility retrieval |
| Atlas Centaur-63 | — | — | April | INTELSAT V-A comsat |
| 51-B Challenger | 7 | 7 | 4-30 | SPACELAB 3: Long Module and Special Structure |

# Director's Fund Supports Special Project Proposals

Sixteen projects have been chosen from among 50 proposals submitted for funding from the Director's Discretionary Fund (DDF) for FY 1985.

In FY '84, 37 such projects were active: four of which began in FY '82; 14 continued from FY '83 and 19 initiated in FY '84.

The average allocation was $38,000, while the largest was $83,000, the smallest was $11,000.

Center Director Noel W. Hinners described the DDF as a program "generating enthusiasm and competition among our innovative scientists and engineers" who otherwise could not get support for their programs because of a lack of funding.

"I want it (DDF) to continue to be a fast turn-around source for high risk . . . ideas," Hinners said.

The following is the list of tasks approved for the DDF for FY '85, their investigators and the amounts allotted to them:

Study of Large Aerosol Scattering, H. Chiu, E. Maier, S. Sofia, K. Schatten, all of code 610.1, $35,000; Simultaneous Geodetic Measurements Using NAVSTAR (GPS) Satellites and VLBI, T. Clark, D. Christodoulidis, W. Boyer of 621, and C. Knight and D. Shaffer, of Interferometrics, $60,000; Seasonal Variation of Global Mass and Momentum, C. Koblinsky, 621, $25,000; Animated Computer Graphics Models of Space and Earth Sciences Data Generated via the Massively Parallel Processor, L. Trenish, 634, and R. Goldberg, 696, $50,000; Microcomputer Version of Mainframe Graphics, H. Eiserike, 631, and E. Sullivan, 684.2, $43,000, and Use and Evaluation of Ultra Low Noise CCDs, B. Woodgate, 681, $45,000.

Also, Shuttle Laser Altimeter, J. Bufton, 723, $80,000; Develop an Inferential Computer Aided Design System, T. Premack, 753.2, $25,000; a Normal-Incidence Telescope for Solar EUV Studies, R. Thomas and G. Epstein, of 682, R. Keski-Kuha, 717, $45,000; Optically Controlled Millimeter Wave Devices,

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# Goddard Goals

Goddard Space Flight Center has developed six goals that, essentially, have become its charter and its framework for day-to-day decisions. These goals provide guidance for structuring the organization and lead to the development of specific objectives against which the Center can measure progress.

To emphasize their significance, the GODDARD NEWS will publish one goal in each of six successive issues. The first goal is:

"In the space and Earth sciences, our role is to provide NASA's principal leadership and competence in those fields essential to the successful conduct of Goddard's mission.

"Our goal is to attain and maintain national or world class excellence in selected scientific disciplines relating to the Earth and its environment, the solar system and the universe. In striving toward this goal, we will:

- "contribute significantly to the acquisition and diffusion of scientific knowledge for the benefit of humanity through active participation in space flight projects.
- "provide expert scientific advice to NASA programs and projects and serve as a link to the external scientific community.
- "make space and Earth science data more accessible and useful to the scientific community by taking the lead in developing and using observational, computational and archival systems that will improve quantifying and modeling of the physical processes that occur in space and on Earth.
- "use the breadth of Goddard's scientific capability to simulate, lead, and conduct interdisciplinary research to enhance our understanding of Earth's environment and man's impact on it, leading to the development of a long-term predictive capability for the total Earth system.
- "enhance the scientific competence and contribution of the U.S. through active cooperation with the academic community of our own nation and with the scientific and space communities of other nations."

**TECHNOLOGY SEMINAR — New York educators get an eyeful in Goddard's Semi-Conductor Development Laboratory/Micro-Electronics Section. They are looking at a 1/4 × 1/4-inch chip containing 30,000 transistors to be used in satellite experiments. Forty educators visited Goddard Jan. 24 for an all-day Space Technology Seminar.**

# Technology Seminar Hosts N.Y. Educators

Officials from the High School Division of the Board of Education of New York City recently received a "powered-packed, non-stop" tour of the Goddard Space Flight Center facilities, during an all-day Space Technology Seminar.

Forty New York City educators attended the seminar, which included the following presentations from Center experts:

1. Research and Development at the Center.
2. The Goddard-managed Getaway Special Program (GAS), open to anyone who wishes the chance to fly a small experiment aboard the Shuttle.
3. Computer-aided design and computer-aided manufacturing.
4. Spartan payload integration facilities; Spartan is a new means for Shuttle-borne sounding rocket experiments.
5. Integrated circuit fabrication.
6. The Spacecraft Magnetic Test Facility.
7. Cooperative education.
8. The Shuttle Orbiter Bay mock-up.

A talk from a Pennsylvania educator who has co-authored a publication on building and operating a weather satellite ground station also was heard.

In expressing the educators' gratitude for the tour, one member wrote on behalf of the group:

"Your tour indicated that our money and efforts are being well directed because the jobs of today and the future depend on knowledge of the processes that were seen."

The response also indicated a special interest in the GAS program, emphasizing, "We hope some day our schools will be represented."

## *Director's Fund*

**Continued from page 5**

G. Alcorn and A. Burgess, of 724, $25,000; Development of Chemically Deposited Long Wave Infrared Detectors, M. Jhabvala, 724, $65,000, and Diamonds for Improving Performance and Reliability of Ku Band $G_aA_s$ Power Field Effect Transistors, Larry Line, 727.3, $50,000.

Also, Superconducting Junctions as Non-dispersive X-ray Spectrometers, A. Szymkowiak, 661, $73,000; An Ocean Ground Truth System, E. Mollo-Christensen, 670, $55,000; a Multi-Channel Fabry-Perot Spectrometer for Infrared Astronomy, D. Jennings, 693, $45,000; a New Cooled Adjustable Corner-Cube Mixer for Submillimeter Heterodyne Receivers, G. Chin and C. Bennet of 693, $75.000.

# *Donating Blood: The Gift of Life*

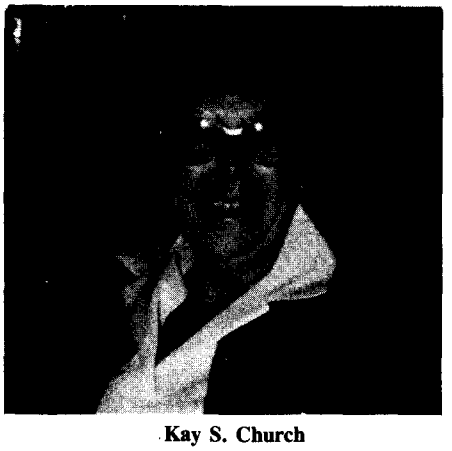
Giving blood is easy; getting it is often difficult. These two short thoughts explain why people should donate blood.

A single donation sustains more than one one life, according to the Red Cross. One donation can be separated into components and used to treat several patients. Some uses for blood components through transfusion therapy follow:

- Packed red cells are prescribed for anemic patients.
- Platelet concentrates control bleeding in leukemic patients.
- Plasma from many donors is pooled to make derivatives such as antihemophilic factor, albumin for the treatment of shock, and gamma globulin which may lessen the severity of certain diseases.

Following is a list of Goddard donors who have given blood so that others might live, and who recently were cited by the Red Cross with gallon pins.

| | Code | Gallons |
|---|---|---|
| Pamela Brown | 225 | 1 |
| Lee Brotzman | 681 | 3 |
| Douglas Buckley | 435.9 | 2 |
| Kent Cockerham | 200 | 2 |
| Edwin Fung | 733.3 | 2 |
| Walter Goodale | 752.3 | 2 |
| Jim Heaney | 717.1 | 2 |
| Peggy O'Neill | 624 | 1 |
| Tom Page | 303 | 3 |
| Henry Price | 720 | 8 |
| Kathy Reardon | 200.5 | 5 |



Kay S. Church

## *Goddard Mourns*

Kay S. Church died suddenly on February 1, 1985, from a stroke that occurred after a short illness. Kay was well known throughout the Center, having a career at Goddard Space Flight Center spanning 24 years. She handled procurement matters for the Laboratory for Atmospheres and several preceding divisions beginning with the Aeronomy and Meteorology Division under Bill Stroud. Expressions of sympathy may be made to the American Cancer Society.

## Red Cross Honors Center

Goddard Space Flight Center and one of its employees recently were cited for their support of blood drives at the 16th Annual Red Cross Blood Services awards dinner held at La Fontaine Bleu Caterers, New Carrollton, MD.

The Center received a certificate of appreciation for "outstanding cooperation in helping to meet the blood needs in the community."

Pamela Brown, the center's Bloodmobile Coordinator (code 225), accepted the award on behalf of the Center, and also received individual recognition.

Brown was the recipient of the Nellie F. Beaver Award, presently annually to a person who has contributed significantly to the success of the Prince George's County Chapter of the American Red Cross.

## Retirees

The following employees retired January 3, 1985 after years of dedication and service to Goddard. We wish them well on their new endeavors and hope we will continue to benefit from their experience and wisdom. The retirees and their work codes are:

Thomas Golden, 701; James E. Greene, 603; Gerard Griffith, 631; Russell Hollingsworth, 750; Raymond Kruger, 302; Freda M. Long, 532; Edward R. Matthews, 034; Paul L. McConnell, 754.3; Clyde J. Morgan, 683.1; Robert Nagel, 751.1; Joseph A. Oktavec, 751.2; John J. Over Jr., 625; Benjamin W. Paxson, 754.4; James W. Poland, 751; Wade Smith, 752.2; and Anthony Votta, 752.2.

Debora McCallum photo

**HIEMAL HOLLY — The wintry weather iced this Holly Tree near building 21 on January 23. Freezing rain coated its leaves and encased its berries while ice-sickles formed all about to look like tinsel.**

## *Spreading Literacy: You Can Help*

**In keeping with President Reagan's 1983 Adult Literacy Initiative, which is intended to address the problem of illiteracy in the U.S., Goddard employees are encouraged to support the national effort by participating in the Federal Employee Literacy Training Program (FELT).**

**Federal employees can help by volunteering services such as babysitting, providing transportation, or clerical support. In addition, the President requested "that each Executive Department and agency . . . cooperate with existing adult literacy programs by assisting them to locate Federal and other space for tutoring, and by encouraging Federal employees to volunteer to serve in these programs."**

**For more information, write to:**
**Diane Wines**
**Director, Adult Literacy Initiative**
**U.S. Department of Education**
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## *Imhoff Returns*

**Continued from page 4**

canopy penetration transponder was set to go. The open transponder site for signal calibration was also established. With both transponders oriented and calibrated for Challenger's orbit 9A, Imhoff got the word from Voice of America that the Shuttle got off at 5 p.m. local time.

During October 6-13, the Goddard/ Bangladesh SIR-B team switched on the transponders, but for some unknown reason the indicator lights were not "triggered" by the SIR-B radar signals from the Challenger.

"On October 10, JPL sent Telex messages to all investigators indicating that many of the first data sets were not taken and that all data takes after orbit 86 were to be cancelled. Our only remaining chances were orbits 88, 104 and 120. There was a very strong urge to pack up and go home at that point", Imhoff said, "but I insisted on a business-as-usual attitude in case of changes, and we set up all the corner reflectors and transponders for the three orbits anyway"

(The JPL later reported that three good data takes were made over the Bangladesh test sites during orbits 88, 104 and 120)

### Jungle Memories

The Goddard scientist has some vivid recollections of his jungle sojourn: when he thought he might not get any data from the experiment (most frustrating); the driving rainstorm one night on the Bay of Bengal en route to turn on the transponders: the boat carrying Imhoff got airborne and was taking water as it was buffeted by the three-foot-high whitecaps (most harrowing). (We also learned that he lived on a boat and ate rice, local fish and cocoanut milk, supplemented by U.S. canned goods from the U.S. commissary at Dhaka).

A re-examination of his extensive mission log suggests that a few other events also belong in the "memorable" category:

"October 7. 10 p.m. Man attacked by tiger near our number one transponder station. The local brought him to me for first aid. The tiger had attacked the man from the rear, biting deeply into his skull. . .I bandaged the victim and transported him two hours up river via speedboat to a " 'hospital' " where he died 24 hours later. . . .

"October 8. . . .The 12-sided corner reflector is constructed 360 meters into jungle across the river from Supoti. A poisonous tree snake is encountered on the railing of the number one transponder site. I was almost bitten in the face and neck. . . .

"October 13. A severe storm blows in. . .transponder site in the jungle is inundated with four feet of slimy water. The bombs used to keep the tigers away will not detonate in the rain. The armed guard became very nervous because crocodiles are now a threat. . .

"October 14. Dysentery has spread through the camp. Eight out of ten people have contracted the disease. . .".

### Rag-Tag Safari

That same day the sick and rag-tag scientific safari shipped out of Supoti bound for Khulna. But the ordeal was not quite over: "Much of the vital forest mensuration data had not been taken. I had to go back", the scientist lamented. Leaving his original team at Khulna. Imhoff flew to Dhaka. The last week of October he returned to Khulna and took a new team to Supoti.

**Marc Imhoff, supervises a team of workers in setting up one of 8 corner reflectors (Photo: courtesy of Imhoff).**

In less than a week, Imhoff and Team Number 2 had plotted each corner reflector/transponder site and inventoried each tree. (36 trees in five diameter classes were cut down, measured and weighed.) They also collected samples for taking wet/dry measurements. All of this data was to be combined with other forest mensuration data to create biomass estimates and assignments to the SIP-delineated forest classification maps. Imhoff closed the log book on the operational part of his assignment.

The rest of the trip was "downhill": return to Dhaka, address to a United Nations group on radar remote sensing and hydrology at Bangkok and the arrival in Washington via New York — all by air.

Imhoff arrived back at Goddard on November 12. It was Veterans Day.

"I felt like one", he said.

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# Goddard News

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## Goddard News Changes

In an effort to bring about wider coverage, the GODDARD NEWS staff has been increased with other personnel in the Public Information Unit of the Public Affairs office.

Under the change, James C. Elliott, chief of the Public Information Unit, becomes executive editor, and Charles Recknagel becomes managing editor. Carter Dove and Joyce Milliner of Wallops become senior editors.