

Thatcher briefed on SMM

British Prime Minister visits Goddard

Margaret Thatcher, Prime Minister of Britain, visited Goddard February 27 to learn firsthand about the cooperative British/American/Dutch Solar Maximum Mission (SMM) that is presently attempting to unravel some of the mysteries of the Sun's violent and periodic solar flares.

In Washington on a state visit, the Prime



Center Director Young greets Prime Minister Thatcher.

Minister, who was once a young chemist and who retains considerable interest in science, spent an hour on Center hearing about the Solar Maximum Mission, viewing Goddard's satellite, integration and test laboratory, and taking in the Network Operations Control Center, which presently tracks some 30 American and international missions (with the Space Shuttle soon to join the list).

Center Director A. Thomas Young, accompanied by Dr. Anthony Calio, NASA Associate Director for the Office of Space and Terrestrial Applications, and Mr. Kenneth Pederson, Director of International Affairs Division,

hosted the tour, during which time the Prime Minister also met with British scientists at Goddard participating on the solar mission. Dr. Christopher Rapley, resident Deputy Principal Investigator and Co-investigator on SMM from Mullard Space Science Laboratory of University College, London, provided an overview of project activities. Mullard Space Sciences Laboratory, as well as Rutherford and Appleton Laboratory, and the University of Birmingham contributed experiment hardware to the Solar Maximum Mission, while many other British laboratories and universities are represented at Goddard by guest astronomers to the SMM observatory.

More pictures on page 4

Goddard contractor selected for Spacelab flight

Loren Acton, contract employee for Lockheed working in the Palo Alto Research Lab, will be one of four payload specialists designated to manage experiments on the Spacelab 2 mission scheduled for launch aboard the Space Shuttle in November of 1983.

Acton, a solar astronomer, will monitor the experiments designed for observing the sun and operate the solar telescope. Acton explained that one of the best advantages of the Space Shuttle is that scientists or payload specialists can take their experiment from theory to practice by accompanying it in space flight.

This enables a more efficient managing of the experiment because of the scientists' thorough familiarity with a project that he himself has nurtured.

Acton will be one of two payload specialists scheduled to fly onboard the Space Shuttle. The other two scientists

Code 100 Notes

Director says Center will 'stand on record'

Center Director A. Thomas Young addressed employees February 6 on his impressions after one year at Goddard. Following are excerpts from his talk regarding recent presidential directives affecting NASA's budget.

"As you are all aware, there is a new administration which was elected with a strong mandate to attack our economic problems—an objective I'm sure we all support. I suspect we also recognize there are no easy solutions to such a problem. Corrective action is going to be painful across the board and the obvious hope is that short term sacrifice will yield long term prosperity. Clearly NASA and Goddard will be affected. How and to what degree I do not completely know, but there are some things we do know and I'd like to discuss them.

"There are several directives that we have received. These include a hiring freeze, a freeze on obtaining furniture, a 15 percent reduction in federal travel, and a 5 percent reduction in consulting contracts. There is also a freeze on the lease, rental, or purchase of ADP equipment, software and some other equipment such as photographic equipment and undoubtedly, some (program) deletions will occur. I expect that we will be affected by the deletions. One reac-

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Inside

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- Applications Milestone: new accuracy in estimating biomass by satellite pg. 5

White House announces planned budget restraints for FY 82

On February 18, President Reagan released his long awaited "Program for Economic Recovery (America's New Beginning)." Popularly known in the press as the "Black Book" for the color of its binder while still a draft by OMB Director David Stockman, the recovery plan makes the following recommendations for reducing NASA spending while maintaining a strong American space program:

The 1982 Carter budget called for a NASA budget of \$6,722 million, a 21% increase over 1981. This sharp increase is incompatible with a program of across-the-board restraint. The revised level for 1982, \$6,235 million, still represents a significant increase over 1981, but one that is needed to maintain progress in the Space Shuttle program to meet civilian and critical defense needs. This increase will also continue strong core programs in space science, space applications, and aeronautics. But funding for these and other non-shuttle programs will be constrained to an increase of 2.9% in light of the current fiscal and economic crisis.

In the area of space transportation, the development and procurement of a fleet of four space shuttle orbiters and the option to buy a fifth orbiter if needed will be maintained. Reductions are limited primarily to slower development of Spacelab, elimination of funding for the solar electric propulsion system (for which no applications have been approved), and rescheduling of space science flight projects. The reduced level in 1982 would be \$540 million above the previously appropriated 1981 level, all of which is needed to complete the Space Shuttle development and make possible a fully operational Shuttle system in the early 1980's.

The reduced budget, while calling for deferral or deletion of some new projects, permits continuation of a vigorous program of space science and exploration. Support is provided to fully utilized spacecraft launched in prior years that are still transmitting useful data (e.g., the Voyager mission to Saturn and beyond). The budget allows for continued development of those projects that offer the broadest potential scientific contribution

and that have large past investments. Specifically, full support is allowed for the further development of the space telescope, a unique Earth-orbiting observatory for viewing objects at the edge of the universe. An orderly progression in the exploration of the planets will be maintained through development of a planetary project, such as the Galileo mission to Jupiter. U.S. participation will also continue, at a reduced level, in the international solar polar mission. However, the adjusted budget also assumes deferral of new and ongoing projects, such as the gamma ray observatory spacecraft, the Venus orbiting imaging radar project, and Spacelab experiments, for which the potential scientific contribution is more narrowly focused and only relatively small past investments have been made. The adjusted program level in 1982 will be \$35 million, or 6% above the previously appropriated level in 1981.

For space applications, most new programs previously proposed to be initiated in 1982 would be deleted and reductions would be made in ongoing activities, some of which unnecessarily subsidize or compete with the private sector. The program at the reduced level would continue support for: research on space remote-sensing techniques and satellite missions that have the potential to improve our ability to

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Adrienne Timothy appointed to Code 900

Dr. Adrienne F. Timothy, formerly of the Office of Space Science at NASA Headquarters, has been appointed Chief, Applications Systems Analysis Office, Applications Directorate (Code 903). Dr. Timothy held the position of Assistant Associate Administrator for Space Science for the past two and one half years. In that position, she served as the chief scientist for the OSS, representing the OSS to the scientific community and serving as the focal point for the planning of the OSS programs. Dr. Timothy received a B.Sc. in physics in 1964 and a Ph.D. in space science in 1971, both from the University College, London.

Directorate Notes: Code 300 offers automated calibration

Starting with this issue, each directorate will be writing regular columns entitled Directorate Notes to keep Goddard readers abreast of new developments and important issues concerning their directorate. The first report highlights one of the latest developments in code 300 called the Automated Calibration System, an improved system used for the calibration of test instruments.

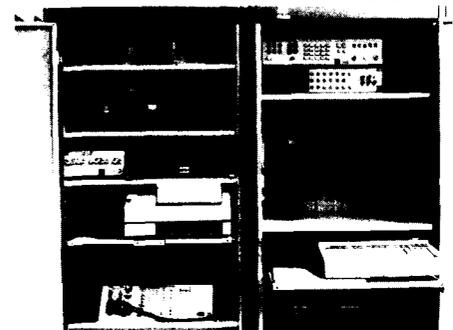
A new transportable system, developed at Goddard and used for calibration of test instruments, provides users improved services for performing "in-situ," or on-site calibration of center test equipment.

The new Automated Calibration System (ACS), developed by the Product Assurance Division, and in operation since July 1980, is gradually replacing the manually operated Assured Performance Calibration (APC) system. The APC system has been operating for about 14 years, serving experimenters who develop spacecraft electronic equipment.

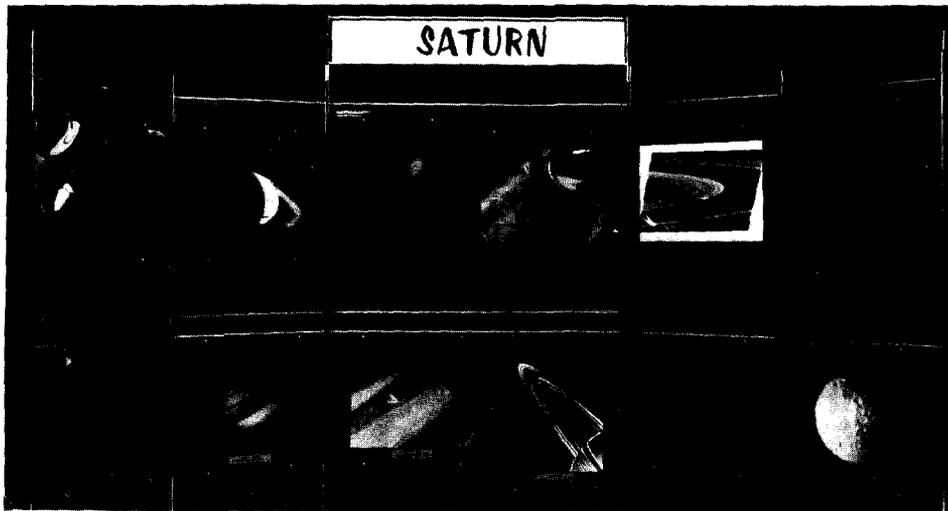
Transportability of both the ACS and the APC system offers a greater advantage to the user in that equipment need not be taken "out-of-service" for calibration. The calibration instruments are housed in a transportable cabinet equipped with four shock absorbing wheels, providing calibration capabilities for voltage, current, resistants, capacitants, inductants frequency, Rf power and AM/FM phase modulation. This is convenient because the instruments can be calibrated in the user's laboratories by moving the system into the laboratory or into a nearby location.

The new ACS offers several advantages over the APC system, said Walter Owens,

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The improved Automated Calibration System



This display of photographs from Saturn will be on exhibit in the Goddard Library through March.



Goddard Health and Safety Officer, Charles Marcus (center), serving as the Prince George's County Advisory Council Chairman, accepts a certificate on behalf of the council from Lawrence J. Hogan Jr., son of County Executive Lawrence J. Hogan. The certificate proclaims February 8-14 as "Vocational Education Week."

REORGANIZATION & KEY APPOINTMENTS

Effective February 22, 1981, Mr. Dale W. Call is appointed Assistant Chief for Shuttle Operations, Network Operations Division (Code 850, 344-7336). In this newly established position, Mr. Call will be responsible for coordinating all activities associated with preparing the Spaceflight Tracking and Data Network (STDN) for the Division Shuttle missions.

Effective February 22, 1981, the title of the Project Communications Engineering Section within the Communications Planning and Analysis Branch, NASA Communications Division (Code 843.2) is charged to Project Support Planning Section, with no change in functions or personnel.

Effective March 8, 1981, the Publications Section, Graphic Arts Branch, Technical Information and Administrative Support Division (Code 253.1), is abolished as a separate organizational entity and its function employees transferred to the Branch office. However, personnel will retain Code 253.1 as a Mail Code.

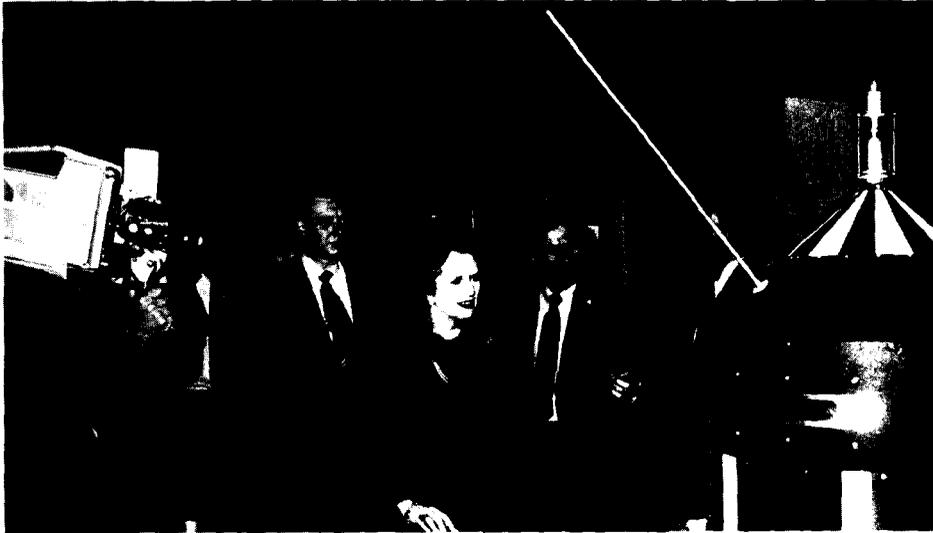
Effective February 8, 1981, Mr. Curtiss C. Barrett is appointed Head, Ground Software Support Section, Ground and Flight Data Management Branch, Applied Engineering Division (Code 734.2, 344-6946).

FLIGHT SCHEDULE (90-day forecast +)

Projected Launch Date	Mission	Launch Site	Launch Vehicle	Window	Remarks
Mid-April 81	Intelsat 5-B	ESMC	Atlas-Centaur	TBD	Reimbursable
April 81	SES-B	ESMC	Delta	TBD	Reimbursable
2nd Quarter 81	DOD-Navy-20 (DOD-Nova-1)	WSMC	Scout	TBD	Reimbursable
May 81	NOAA-C	WSMC	Atlas-F	TBD	Reimbursable
June 81	Intelsat 5-C	ESMC	Atlas-Centaur	TBD	Reimbursable
June 81	RCA-D	ESMC	Delta	TBD	Reimbursable
June 81	FLTSATCOM-E	ESMC	Atlas-Centaur	TBD	Reimbursable
Sept 81	Intelsat 5-D	ESMC	Atlas-Centaur	TBD	Reimbursable
4th Quarter 81 (45-day call up)	DOD-Navy-21	WSMC	Scout	TBD	Reimbursable
Sept 81	SME	WSMC	Delta	TBD	

Prime Minister Thatcher briefed at Goddard

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Prime Minister Margaret Thatcher of Great Britain pauses to view a model of a British spacecraft, UK-2, during her visit at Goddard. The Prime Minister was escorted on her tour of the space center by A. Thomas Young, Center Director.



British scientists Dr. George Simnett (left) and Dr. Christopher Rapley (right) brief Prime Minister Thatcher. Simnett and Rapley explain a display before them which outlines the observations being made by two instruments—built and operated by the British—aboard NASA's Solar Maximum Mission spacecraft.



Mail your story to the
Goddard News, Code 202,
or call the Editor at

344-5566

New Shuttle external tank under development

Assembly of the Space Shuttle's first lightweight external propellant tank has begun at the Marshall Space Flight Center in New Orleans, La.

Work began with the precision trimming and welding of aluminum gore segments to form the aft dome of the liquid hydrogen tank. The first lightweight tank is expected to be completed and ready for delivery in the summer of 1982, in time to support the Space Shuttle's fifth launch.

The modified tank will be 6,000 pounds lighter than its predecessor, and will therefore increase the Shuttle's payload carrying capability by about the same amount.

To accomplish this weight reduction, the External Tank has been redesigned to incorporate the results of a recently completed structural test program. The program showed that it is possible to reduce the thickness of many of the aluminum skin panels without affecting the integrity of the tank.

Changes to the materials used in certain components have also been made to take advantage of recent developments in the metals field. And, the antigeysers line, used in the liquid oxygen fill system, is also being deleted. The feasibility of its removal will be verified during tests

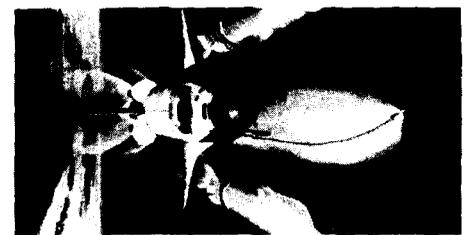
Fund raiser to be held for accident victim

Many of you here at Goddard know Richard F. Schmidt. For some who may not—Dick is a recognized expert in antenna theory and analysis. He formerly worked in Antenna Systems Branch, Code 811, and now is employed by Microwave Sensors Branch, Code 946.

On August 8, 1980, Dick's son Carl was injured in a swimming pool accident and is paralyzed from the neck down. Some of Dick's friends at Goddard and members of Redeemer Lutheran Church, College Park, and St. Matthias Catholic Church, Lanham, have organized a fund raising dinner scheduled for Sunday, April 5. The dinner will be held at the VFW Free State Post 8950 on Good Luck Road (near Duval High School). The purpose of the dinner is to help raise funds to pay for Carl's medical treatment and care, and as a testimonial to Dick's steadfast devotion to his son throughout his ordeal.

For information and tickets, the following people can provide assistance:

Freda Long: 344-8973, Code 811, Bldg. 12; Hugh O'Donnell: 344-7652, Code 811, Bldg. 12; John Fuchs: 344-7153, Code 946, Bldg. 22; Carl Riffe: 344-5319, Code 727, Bldg. 19.



of the Shuttle's main propulsion system at the National Space Technology Laboratories near Bay St. Louis, Miss.

The External Tank—actually two tanks connected by a collar-like intertank—carries the liquid hydrogen and liquid oxygen propellants for the Shuttle's three main engines. It is the only major element of the Shuttle that is not recovered for reuse.

The External Tank is being built by Martin Marietta Aerospace, Denver Division, under contract to the Marshall Center.

Professional Intern Program provides

career growth

During the past decade, over 1,000 professionals have participated in the Center's Professional Intern Program (PIP). The purpose of PIP is to help new professionals adjust to Goddard by providing experiences to help them grow professionally. Over 200 scientists, engineers, and administrative personnel are currently participating in the program.

Activities involve coursework, lectures, committee participation, progress reports and oral presentations. Supervisors play an integral role both in the program itself and in the career growth of interns by providing challenging assignments and monitoring their completion.

For most interns, the program covers a maximum of 36 months at the Center, or until they achieve two career promotions. It consists of two levels of participation: Level I, basic professional development; and Level II, continued developmental activities. A separate 18-month program is available for interns having a Ph.D. degree. Many former interns are currently in management positions throughout the Center. Any question regarding PIP, its requirements and its benefits can be addressed to Sandy Walter, 344-8930.



Kathy Schifflett, code 260, gives her oral presentation, fulfilling a PIP requirement.

Correction:

The organizational title change for Code 915, previously Climate and Radiations Branch, was improperly cited in the February 16 issue of the Goddard News. The correct new title for the organization is Climate and Radiation Branch.

Goddard Contractor Selected for Spacelab flight

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will operate from ground stations on Earth. The names of the remaining three

payload specialists are: John-David Bartoe, Diane Prinz, and George Simon.

Payload Specialists



LOREN ACTON
LOCKHEED PALO ALTO RESEARCH LAB



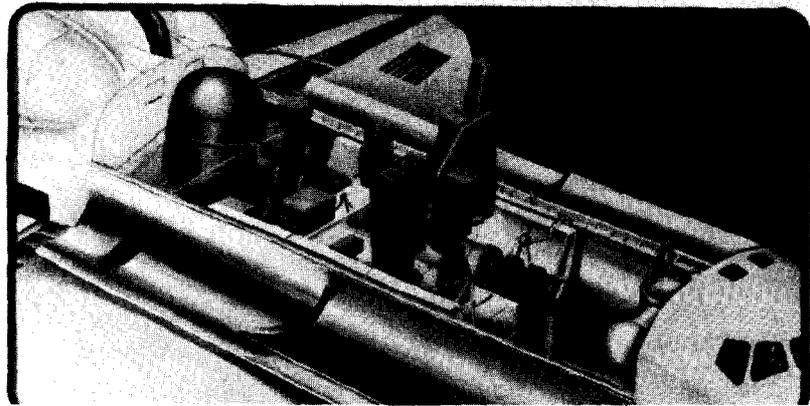
JOHN-DAVID BARTOE
NAVAL RESEARCH LAB



DIANNE PRINZ
NAVAL RESEARCH LAB



GEORGE SIMON
AIR FORCE GEOPHYSICS LAB



APPLICATIONS MILESTONES

New technique for estimating biomass

Preface: Analysis of the spectrum of light reflected by vegetation on the Earth's surface towards a satellite can reveal the amount and kind of vegetation present. Scientists at Goddard are seeking to better understand relationships between spectral reflectance and biomass as one means of improving range management and early prediction of crop yields.

Significant Results: Using a theoretical model, two simplified working relationships which provide easy-to-use spectral estimations of important vegetation canopy variables have been formulated to successfully predict biomass values even in arid lands. Tests on biomass data of alfalfa and shortgrass prairie canopies indicate that:

@ both simplified equations accurately depict the observed relationships between biomass and spectral reflectance,

@ the simplest exponential formula works favorably in analysis of the biomass/reflectance data—deviating by only 0.5 percent from the more complicated

formulations, even under widely varying illumination conditions,

@ the theoretical relationships between canopy variables and the diffuse spectral reflectance are shown to be useful for accurate estimation of alfalfa and shortgrass prairie biomass utilizing measurements of plant canopy reflectance.

Practical Uses: The relationships developed can be applied to monitoring the forage biomass production of natural grasslands and pasturelands using remote sensing data. Confidence levels of predicted biomass values by the relationships do not vary significantly for the whole range of data (namely zero to infinite), something not achievable in most simple regression models. Thus, the potential exists for the accurate assessment of the vegetation even in arid lands having sparse plant canopies.

For further information, contact: Dr. John K. Park (Code 924) or Dr. Don W. Deering (Code 923).

Code 100 Notes

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tion to all this can range from 'wow' to depression. Let me tell you what we've been doing and what I hope will be our collective attitude. My general reaction is that we'll stand on our record.

"You are probably thinking 'what does that mean'? We've been trying to assure that our capabilities and contributions to national needs are well recognized. The Center performance review communicated that this has been successful. We've been spending a lot of time understanding our manpower situation and recently had an in-depth review with Ed Kilgore. I know he understands that we are heavily committed.

"In summary, in anticipation of the current situation, we have been trying to assure that those who will be making decisions and providing information for higher level decision making are honestly informed as to our capabilities, contributions, and needs.

"My second reaction is that we'll do nothing to circumvent the presidential directives. It is our responsibility to advocate our position, provide supportive information, and once a presidential decision is made, to implement the decision.

"My third reaction is to work even harder at doing my job, and I ask you to join me in this approach. A characteristic of our country is that when the going gets tough, it brings out the best in us. That is also a characteristic of NASA. This is no time for depression or dissension, it is a time for professionalism and dedication. I'll keep you informed as we get more information.

"During the next year I intend that we give major attention to greatly increasing

the quality of our commitments for new work, revalidating some of our commitments for on-going work, establishing performance measuring systems for our projects and assuring we have advanced warning for problems. I intend that we manage our programs, not monitor contracts. I strongly believe our future depends upon success in these areas.

"As I mentioned in the introduction, I could not properly cover everything that is important to Goddard. If I've not commented on something of interest to you, please ask a question.

"I'd like to close with a statement I made in a speech to the National Space Club last week. I believe our contributions of the past and our current capabilities are clear indicators of our future potential in meeting national needs. I'm willing to stand on our record and I ask you to join me.

"Just one more comment. The question I'm most asked is 'How do you like Goddard'? My answer is the same today as it has been throughout the year 'Super, Great, Fantastic, Goddard has excellent people, outstanding facilities, and an exciting program of national importance. What more could one ask'?"

THANK YOU.

Budget

Continued from page 2

manage critical Earth resources; research related to understanding weather and climate; and research on advanced space communications technology needed to increase the useful range of radio frequencies for communications. The reduced level in 1982 would be 6% above the previously appropriated level for 1981.

For aeronautics, reductions are related to elimination of new projects previously proposed for 1982 and lower-priority

research and technology base activities. The reduced level would continue long range research efforts needed to maintain the U.S. technological lead in military and civil aeronautics. The reduced level in 1982 would be 4% above the 1981 level.

Reductions would be made in general support activities, such as construction projects, direct NASA energy technology work, and technology dissemination efforts that are either of lower-priority or are related to reductions in other agencies.

Calibration

Continued from page 2

Technical Monitor of the Calibration Laboratory, code 311. It decreases the chance of operator error because the calibration instruments are operated and controlled through a calculator-controller, using approved programs which require the operator to follow step-by-step procedures.

In addition, Owens said that ACS reduces operator training, provides more uniform calibrations, and establishes more data points, providing hard copy documentation of the calibration results.

Although the ACS has been operating for less than a year, initial reactions have been favorable. For example, Owens noted that he has found users are more likely to send the ACS rejected instruments to be serviced because of the documented results indicating why an instrument was rejected. These documented results decrease repair time because the problems are more readily detected.

One of the most innovative aspects of the ACS, explained Owens, is that it permits calibration programs to be written for a wide variety of instruments located in the user's laboratories. The programs are written by the technicians who perform the calibration, thus permitting persons directly involved in the ACS operation to design programs for specific instruments.

During calibration, instruments are adjusted to bring them within specifications whenever practical to do so. For instance, if adjustments are accessible without removing instruments from racks or if disassembly is not necessary, this method is used. This is a considerable cost saver over conventional procedures where equipment must be sent to a central facility for either calibration or adjustment.



GODDARD NEWS

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<p>Editor: Charles Recknagel Asst. Editor: Karen Jackson David W. Thomas</p>	<p>Editorial Assistant: Pat Ratkewicz Pictures: Photographic Section</p>
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