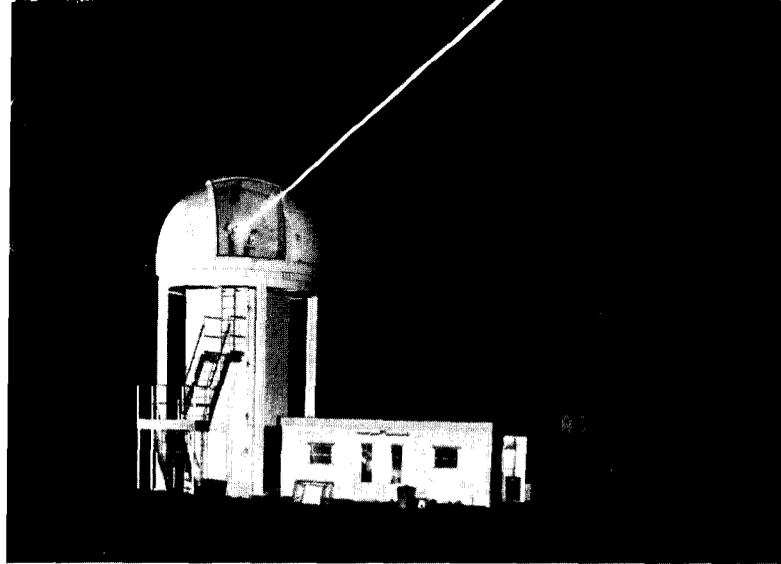


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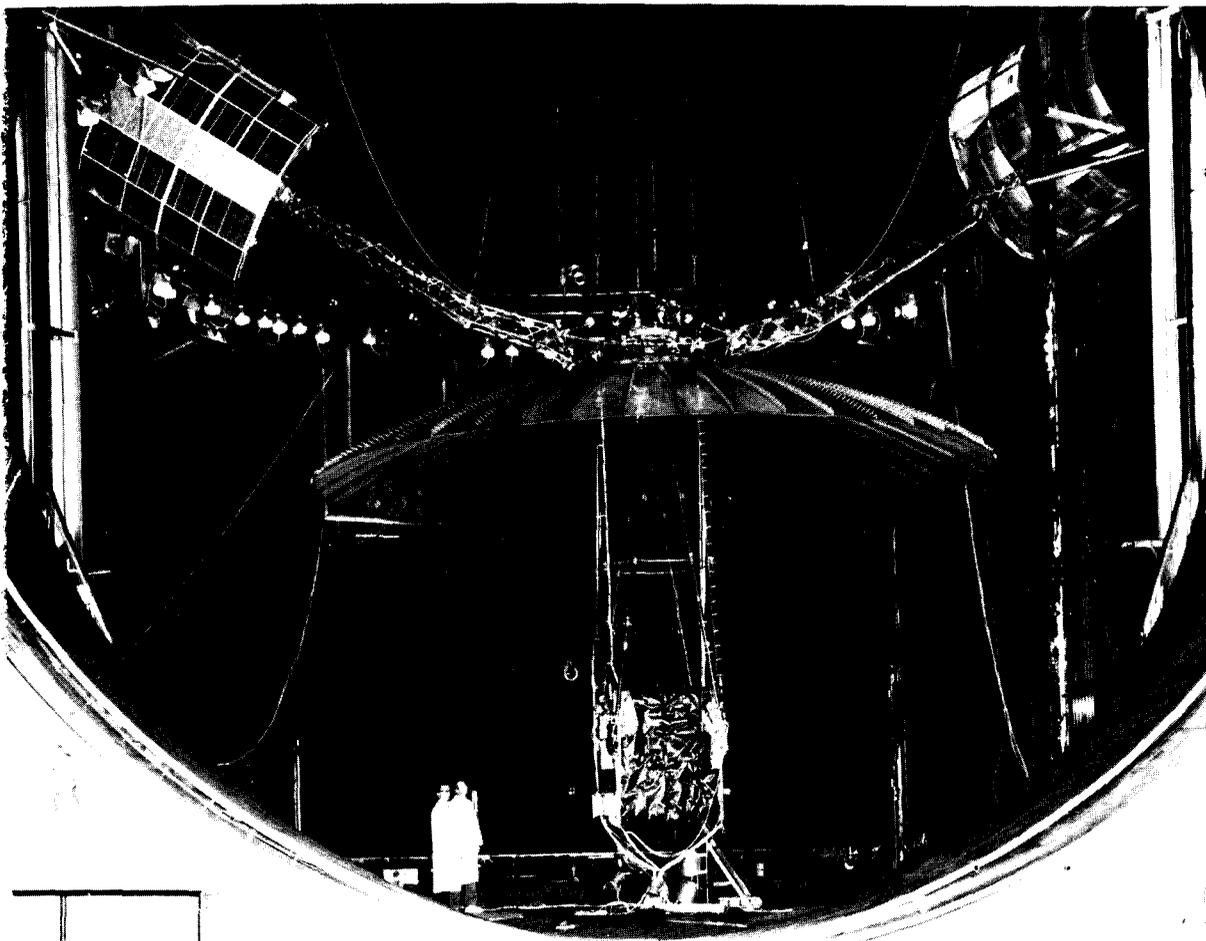
news

October 1973 Vol. 21, No. 7



SKYLAB EXPERIMENT. The argon ion laser at the Goddard Optical Research Facility (shown here in operation at night) emits a continuous beam in the blue/green wavelengths of the visible spectrum. The beam is so powerful that it was seen easily by astronauts of Skylab-3 during the daytime. The laser will be used for the Earth Laser Beacon Experiment during Skylab-4. See Page 2.

THE LARGE HORN shown being placed alongside the Launch Phase Simulator will be used to convert the entire LPS rotunda into a reverberation noise chamber for testing such large spacecraft as the ATS-F Proto-flight Spacecraft. See Page 6.



ATS MILESTONE. The huge 30-ft parabolic reflector of the next Applications Technology Satellite (ATS-F) was successfully deployed during thermal vacuum tests at the Johnson Space Center in September. ATS-F, scheduled for launch in April of 1974, will be the largest and most advanced spacecraft in the ATS series. For the story of the recent test, see Page 5.

ANNOUNCEMENT

1973 GSFC Battery Workshop

In keeping with the past years tradition Goddard will again sponsor the ANNUAL NASA/GSFC BATTERY WORKSHOP. This year it will be held on November 13, 14, and 15, 1973 in Building 26, Room 205. The meeting will be open to manufacturers, users and government personnel who have an interest in secondary battery systems.

As in the past, the main emphasis will be placed on problems that exist today, and recent improvements made in the nickel-cadmium battery area. Also, the program will include new developments in high energy density systems, in particular, the metal hydrogen system. The program will not be limited to aerospace but may also include discussions of military, medical and commercial applications.

For further information, please call Floyd Ford on extension 6202 or Tom Hennigan on extension 5547.



BENITA A. SIDWELL is the new Assistant Chief of the Manpower Utilization Division. The former head of the Administration and Management Branch, Ms. Sidwell came to Goddard in August of 1970 from NASA Headquarters where she had been a management intern in the Office of Personnel for two years. Ms. Sidwell was born in Santa Fe, New Mexico. She received her B.A. degree in political science from Earlham College in Richmond, Indiana in 1965; her M.A. in 1968 from Indiana University in Bloomington; and has continued her work in government studies at George Washington University. In her spare time, her hobbies include house restorations and ceramics.

Skylab Astronauts Spot Goddard Laser from Space

Astronauts aboard Skylab-3, some 435 kilometers above the earth, have been able to spot the light beamed into space during broad daylight from a powerful laser located at Goddard. Members of the Skylab crew sighted the beacon twice—once in the afternoon of September 19 and once in the morning of September 20—as part of preliminary studies for a Skylab Earth Laser Beacon Experiment (SELBE) to be conducted during the final Skylab mission later this year.

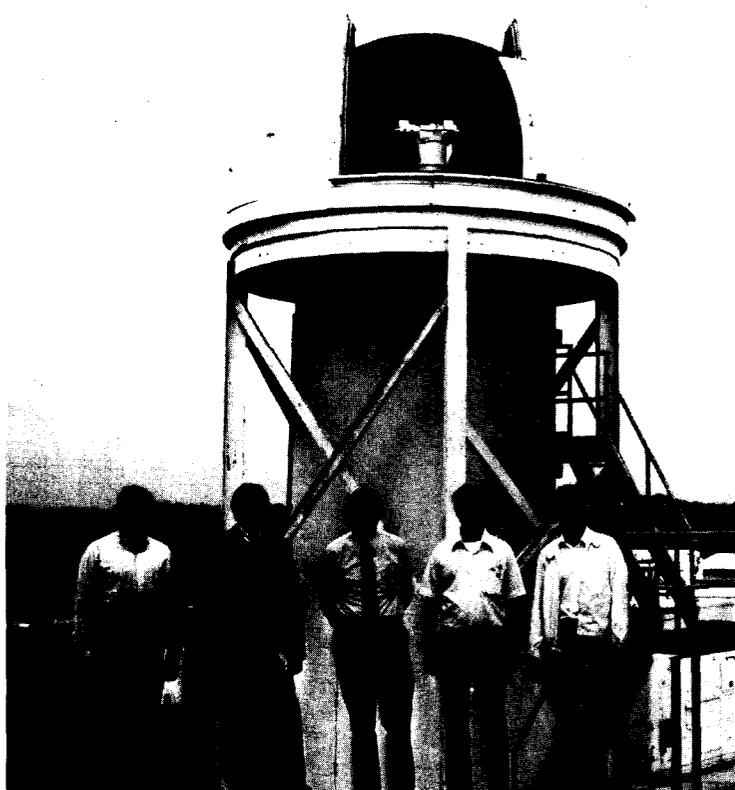
The Skylab-4 experiment will use an earth-based, continuous wave laser beacon as an “artificial star” for visual navigation and manned spacecraft control. The purpose of the experiment will be to provide NASA with a realistic assessment of the laser’s value as a terrestrial visual sighting aid for spacecraft navigation and control and a tracking and calibration reference for earth oriented scientific instruments. Investigations will also be made into atmospheric distortion of data from a variety of earth sensing instruments.

The SELBE project, which is officially designated as TO-53 SKYLAB, Earth Laser Beacon Experiment, is a joint effort between scientists of the Lyndon B. Johnson Space Center in Houston, and Principal Investigator Louis O. Caudill here at Goddard. Plans, as presently constituted, call for the illumination of the Skylab with a high power (100 Watt) argon ion laser from Goddard’s Optical Research Facility (GORF) during a specific series of passes.

Power output and spectral content of the laser beacon will be varied during each pass and recorded on the ground. When a Skylab astronaut is the primary sensor he will describe and record the ease of sighting and his ability to follow the “artificial star” with and without optical aids. In the case of measurements where the primary sensors are earth-oriented instruments, the astronauts will point the instrument at the beacon as Skylab passes over the Washington, D.C., area. Ground beacon data will then be compared with sensor data after the mission to determine how well experiment objectives have been met.

The argon ion laser to be used has a multispectral output entirely in the blue/green portion of the spectrum. However, results of the experiment will be directly applicable to the future use of a wide variety of lasers with outputs from the ultraviolet to the far infrared.

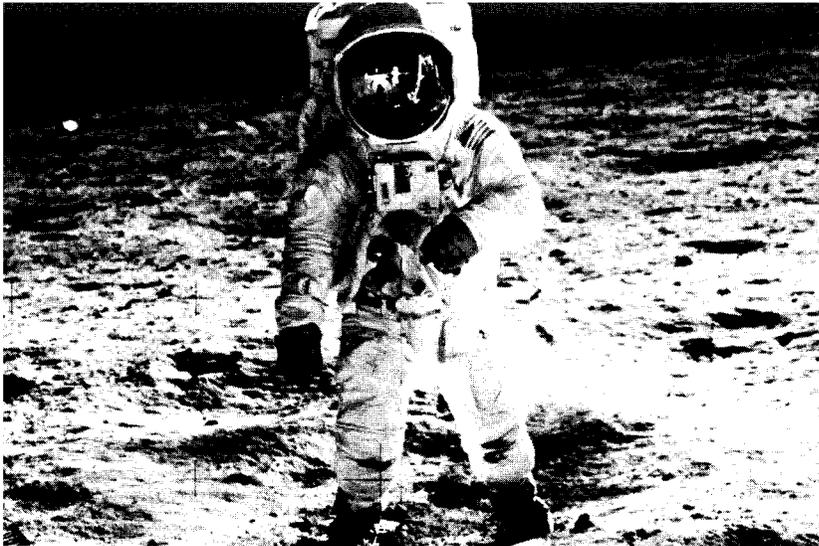
Tom McGunigal, Experiment Manager and Head of Goddard’s Laser Experiments Office, comments, “The tests conducted on September 19 and 20 were preliminary to the experiment scheduled for Skylab-4. In the future we look forward to other applications of this laser technique such as the illumination of unmanned observatory type spacecraft. We do not know all the possible applications yet.”



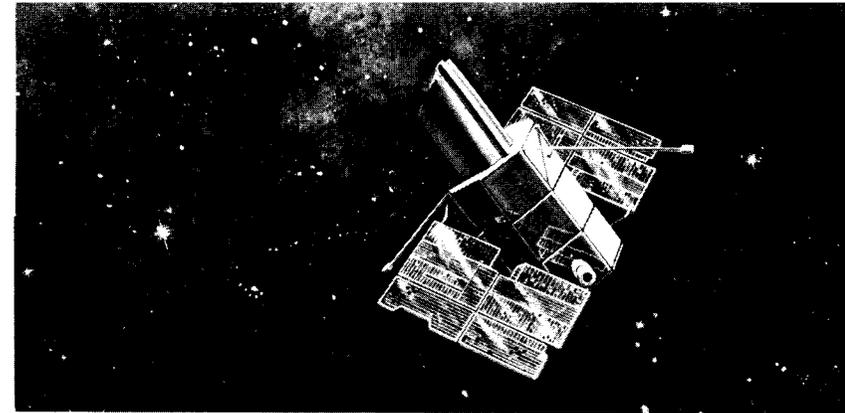
THE SKYLAB BEACON TEAM. From left are Sol H. Genatt, Optical Site Manager; Louis O. Caudill, Principal Investigator; Thomas E. McGunnigal, Experiment Manager; Jimmie D. Fitzgerald, RCA Computer Technician and Edwin G. Reid, Electronic Technician. Not shown is Bartis E. Williams, RCA Safety Radar Operator.

Other members of Goddard’s SELBE team include Ed Reid, Goddard Electronics Technician; Jim Fitzgerald, Computer Technician from RCA; Sol H. Genatt, Goddard Optical Site Manager; and Bartis E. Williams, RCA Radar Operator.

Skylab-3 crewmen Alan L. Bean, Jack R. Lousma and Owen K. Garriott splashed down in the Pacific on September 25 after a record-breaking 59 days in orbit. Skylab-4 crewmen Gerald P. Carr, William R. Pogue, and Edward G. Gibson will be launched to the orbiting space station on November 11.



MAN ON THE MOON. Astronaut Edwin E. Aldrin, Jr., was lunar module pilot on the crew of Apollo 11, first manned lunar landing mission in July, 1969. This picture was taken by Astronaut Neil A. Armstrong, commander, with a 70mm lunar surface camera.



COPERNICUS, launched in 1972, is the most recent of Goddard's Orbiting Astronomical Observatories. The OAO spacecraft, along with the Small Astronomy Satellites, the Interplanetary Monitoring Platforms and the Radio Astronomy Explorers, have given scientists a wealth of new information on the origin and evolution of the universe.

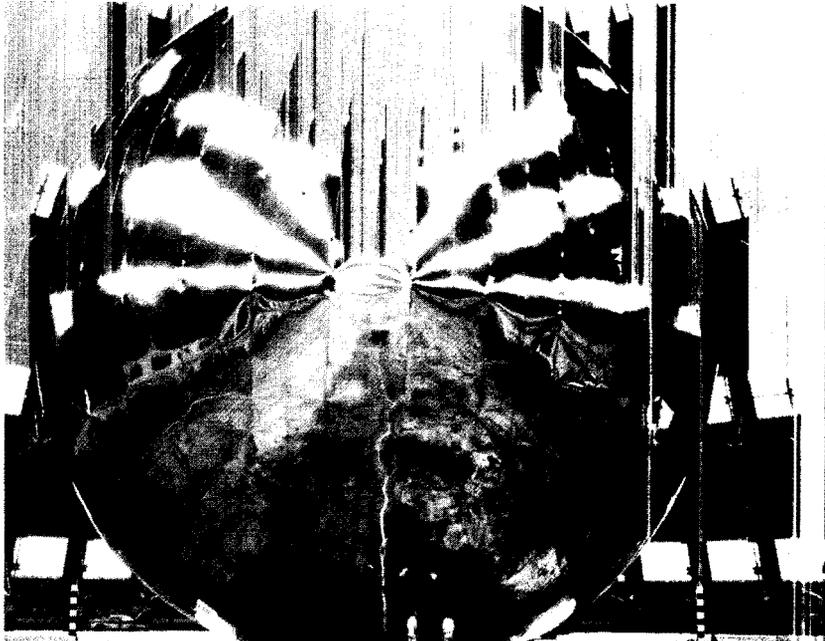


MOUNTAIN ON MARS. This gigantic volcanic mountain—called Nix Olympica—was photographed by Mariner 9 in late January, 1973, as a great Martian dust storm subsided. It is estimated that the mountain is 500 kilometers (310 miles) across at the base. The mountain is more than twice as broad as the most massive volcanic pile on Earth.

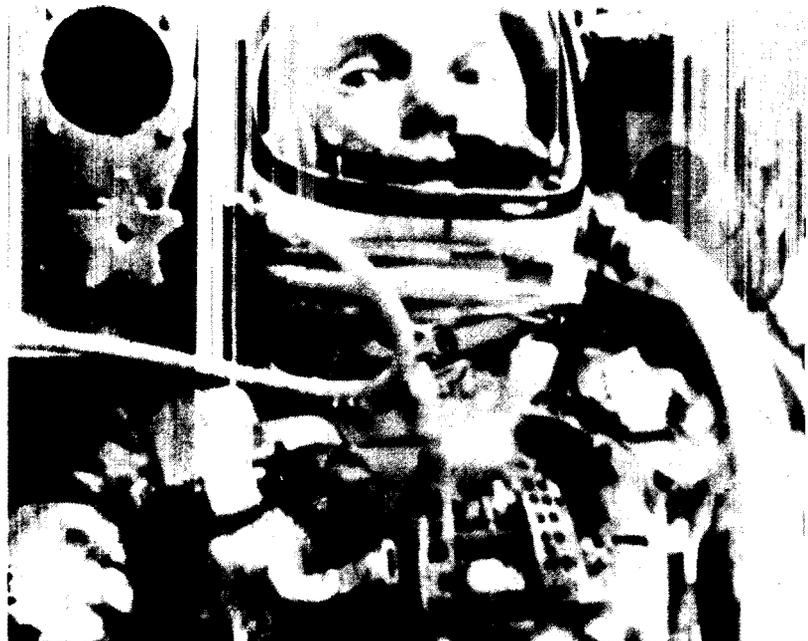
NEW YORK TO NORFOLK. This six-photo montage is a composite photo taken by the Earth Resources Technology Satellite-1 (ERTS-1) from an altitude of 905 kilometers (562 statute miles) on two successive days, October 10-11, 1972.

SKYLAB II IN FLIGHT. This excellent view of the Skylab space station was taken from the Command Module during a final "fly around" inspection. The three-man crew spent 28 days in Skylab after their May 25, 1973 launch from Kennedy Space Center. The second manned mission to the station was launched two months later and splashed down on September 25 after 59 days in orbit.





ECHO I—GLEAMING GLOBE. The first passive reflector communications satellite, Echo I, an inflatable 100-foot globe of aluminum-coated mylar plastic, covered more than a billion miles in its almost eight years in space. From its launch on Aug. 12, 1960 until its long career ended on May 28, 1968, it was easily visible to the unaided eye over most of the earth. Echo I is believed to have been seen by more people than any other man-made object.



EARTH ORBITER. Astronaut John Glenn was photographed in space by an automatic sequence motion picture camera as he became the first American to orbit the Earth on Feb. 20, 1962. His Mercury spacecraft—Friendship 7—made three orbits in its 4 hour 55 minute flight. Glenn was in a state of weightlessness traveling at 17,500 mph as this picture was taken.

NASA 15th Anniversary

October 1 1958-1973

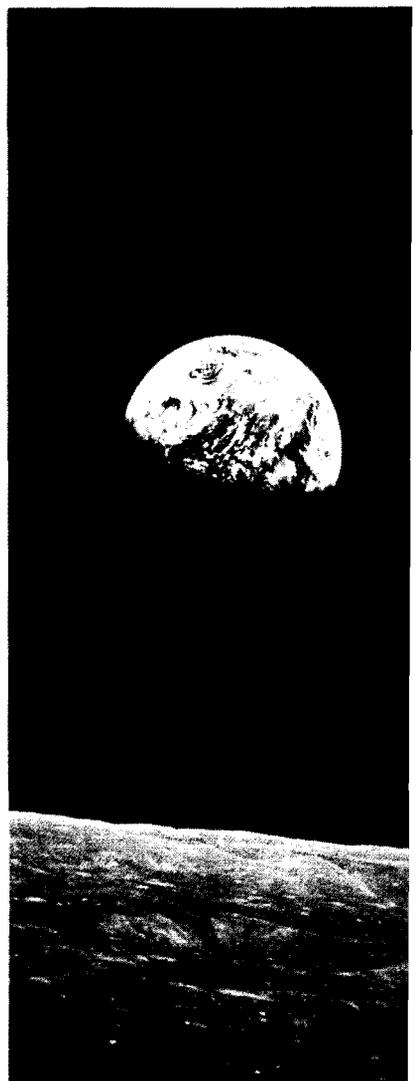
“In our first 15 years, we have created a strong base for further progress in each of the main areas of space opportunity—science, exploration and applications—and have placed increasing emphasis on applications as the years went on and capabilities for winning practical benefits increased We are now in a new and different phase of the American space effort”

Dr. James C. Fletcher
NASA Administrator

WEATHER SATELLITES. Early this year, the Electrically Scanning Microwave Radiometer aboard Goddard's Nimbus-5 produced this mosaic image showing the contrast between snow and ice in the polar regions and rain and clear areas over the oceans. Nimbus-5 is the latest of a series of R&D spacecraft that began with the launch of Nimbus-1 in 1964. Sensors developed by Nimbus have flown on the TIROS/ESSA/NOAA series of operational satellites.



AVIATION RESEARCH. This research model casts a giant shadow in the 19-foot pressure tunnel at NASA's Langley Research Center in Hampton, Va. NASA has continued the long and successful record of its predecessor agency, the National Advisory Committee for Aeronautics, in preserving the role of the United States as a leader in civil and military aeronautical technology.



EARTH VIEW. This view of the rising Earth greeted the Apollo 8 astronauts as they came from behind the Moon during their December, 1968 mission. This was the first manned Saturn V flight and the crew orbited the Moon 10 times.

Important Milestone Reached by ATS-F Project

by Robert C. Service

At 1:07 p.m., CDT, on September 14, 1973, at Johnson Space Center, Houston, Texas, the Applications Technology Satellite Project passed a significant milestone. The 30-foot diameter parabolic reflector of the ATS-F spacecraft, completed a very successful deployment test after a catastrophic failure a year ago last April.

Roy Courtney, the ATS-F project technical officer of the deployment tests, reports that the objective was to successfully deploy the parabolic reflector on the thermal-structure model spacecraft under simulated space conditions of vacuum and zero gravity. On the first thermal-vacuum cold test in April 1972, at the Manned Spacecraft Center (now the Lyndon B. Johnson Space Center), two gore panels on opposite sides of the reflector ripped on deployment. Lockheed Missile and Space Company corrected the difficulty and a series of tests qualified the reflector for another deployment test.

At lunch time on Friday, the 14th of September, an excited cluster of engineers comprising ATS-F project co-workers from Fairchild Industries and Goddard Space Flight Center gathered around a closed-circuit TV to watch the live-televised deployment test of the ATS-F parabolic reflector subsystem (PRS). The same scene was being duplicated in Johnson Space Center some 1500 miles away. In just 1.45 seconds after zero countdown, the PRS was deployed and stable. Excited comments could be heard among the group at Goddard. It was highly successful and well within the limits predicted by Fairchild Industries, the prime contractor. Among those present were Harry Dornbrand, Vice President of ATS Programs, Fairchild Industries; and John Thole, Goddard's ATS-F Project Manager.

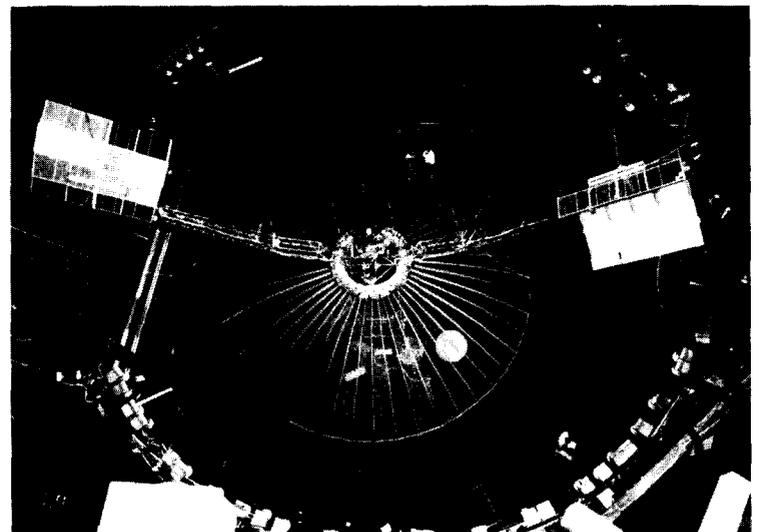
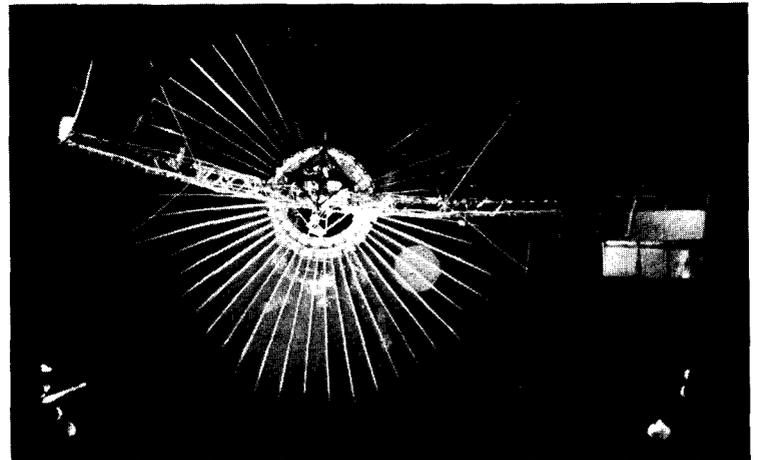
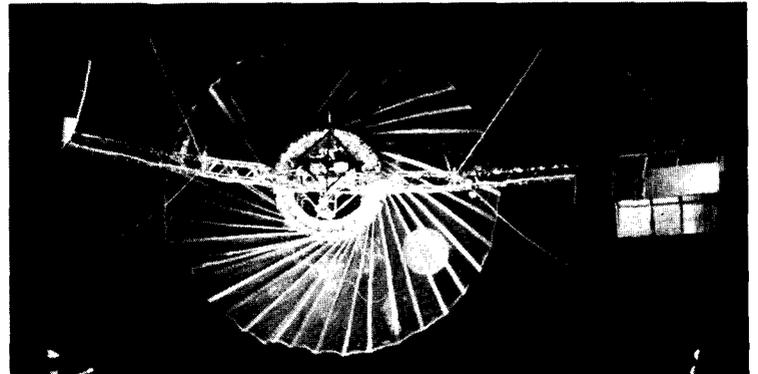
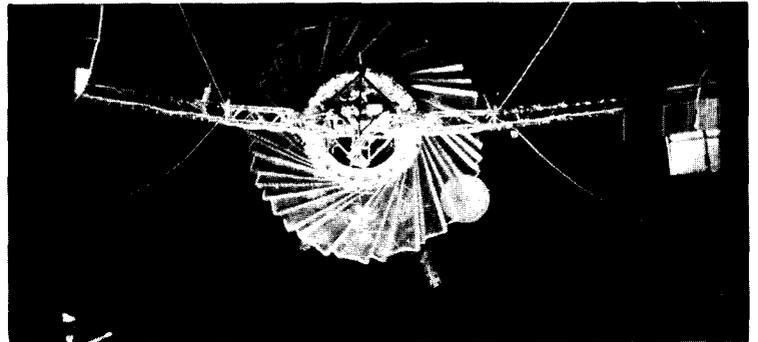
Johnson Space Center has the largest man-rated thermal vacuum chamber in the United States and was the only place where ATS-F, with its 54-foot span, could be tested.

The chamber is 65 feet in diameter and 120 feet high, just barely large enough for the spacecraft to fit in with the required instrumentation. The Space Environment Simulation Laboratory, headed by James McLane, performed the tests for the ATS-F Project. The unified test program required close intercenter and contractor cooperation, and personnel from Johnson, Goddard, Fairchild and Lockheed functioned as a highly coordinated team.

Pretest operations commenced three weeks before deployment and took place outside of the chamber at the test preparation area during the first week and within the chamber the last two weeks. Preparations included instrumentation of the thermal-structural model and the chamber with accelerometers, strain gauges, rate gyros, thermocouples, television and high-speed photographic equipment. Within the chamber, the thermal-structural model was positioned with the booms deployed and raised to the second-motion position (121.5 degrees from launch configuration) and with the solar arrays rotated 180 degrees. The body of the model was suspended by four cables and each boom-array assembly was suspended by two cables, each at their center-of-gravity. All eight cables were attached to swivel 85-feet above the chamber floor. Any possible motion of the spacecraft was restrained by tethers to prevent impact with the chamber although they were not needed during the test. Electrical integration of the instrumentation and check-out of all cabling was completed in the final phase of activity.

At the conclusion, post-test operations were conducted for one week. During this time the thermal-structural model, the parabolic reflector subsystem and the booms with the solar array panels were separated in the chamber. Each component was removed individually from the chamber, inspected, the contour of the parabolic reflector was measured, and the entire spacecraft was placed on a transporter and prepared for shipment to Fairchild Industries at Germantown, Maryland.

This action successfully completed the mechanical and structural qualification program for ATS-F.



Deployment of the ATS-F Reflector

T&E's New Approach To Acoustical Testing of Large Spacecraft

A large acoustic horn placed in the Launch Phase Simulator (LPS) rotunda is being used to convert this huge chamber into a reverberation noise test facility. Conversion of the LPS rotunda for large scale acoustic testing has been under the direction of Harry Cyphers of the Structural Dynamics Branch. His proposal for utilizing the horn (on loan to Goddard from the Agricultural Research Center) and the purchase of a recently developed high intensity noise generator will provide Goddard with the largest known reverberation noise test chamber in the free world. The chamber is 27 feet high and 157 feet in diameter.

The proposal for a low cost, short turnaround test capability was very attractive to the ATS-F project and the new facility will initially be used to acoustically test the complete ATS-F Protoflight Spacecraft which is over 26 feet in length. Goddard's proximity to the prime contractor's plant in Gaithersburg will minimize spacecraft out-of-house time. Test costs will also be minimized since the present LPS support systems and operating personnel can be utilized.

Goddard's Structural Dynamics Branch has been a pioneer in the use of cylindrical rooms for environmental testing starting with initial scanning of the Launch Phase Simulator itself. During the LPS conceptual design, over ten years ago, the cylindrical test chamber configuration was selected for structural and aerodynamic reasons. At that time, the facility requirements were based on a spacecraft 15 feet in length, 10 feet in diameter and weighing up to 5000 pounds. According to the then accepted theory of acoustic testing, it was necessary to expose the entire spacecraft including its protective launch shroud to a progressive wave noise field. In this type of test the sound travels along the exterior of the shroud just as it does at launch. Testing in this manner required use of an inner chamber liner, slightly larger in diameter than the spacecraft shroud, to couple the sound properly to the protective shroud. By the time the larger Delta launched spacecraft were being tested on the LPS, experience had shown that without the spacecraft protective shroud and the chamber liner, the chamber performed as well as the country's finest reverberation chambers, and was so used on the first and second generation satellites.

However, with the present and proposed class of satellites and the future shuttle with its capacity for carrying large cargoes, test specimens in excess of Goddard's present capabilities may be expected. In searching for a means of economically testing these large spacecraft of today and tomorrow, T&E's acoustic engineers decided to draw on previous experience and made preliminary evaluations of the reverberant properties of two existing large cylindrical chambers, namely, the Dynamic Test Chamber and the LPS rotunda. Experience has shown that the classical reverberation room design which had been limited to regularly shaped rooms could be extended to round rooms. This, indeed, confirms the original LPS design concept.

The task of evaluating these facilities, setup and conduction of the ATS-F test falls to Arney Munson. He is assisted in the theoretical studies by Frank On. These men, both of the Structural Dynamics Branch, are presently conducting a series of low-level tests and computer analyses to determine the detailed acoustic characteristics of the two chambers. Their preliminary studies show that, in general, large irregularly shaped hard-walled rooms make good reverberation chambers. Utilization of these large enclosures did not become economically feasible, however, until a large efficient noise source became commercially available. A generator of this type is now on order and is due to be delivered by October 15 in time for use on this testing program.

This expanded acoustic test facility capable of testing all foreseeable NASA spacecraft is only one example of the inherent versatility of the Launch Phase Simulator. The LPS is presently equipped to do combined environment testing utilizing pressure profile, vibration, steady state acceleration and acoustic real time simulations.



T&E Engineer prepares to determine the acoustic properties of the Launch Phase Simulator rotunda using a low level loudspeaker noise source.



BOECKEL IN CONNECTICUT. A color photograph of Connecticut as taken from an altitude of 600 miles by the Earth Resources Technology Satellite (ERTS) is presented to Connecticut Governor Thomas J. Meskill as he issues an official statement designating October 1-6 as Space Week in Connecticut in observance of NASA's 15th anniversary. The presentation was made by John Boeckel (second from left), Goddard's Deputy Project Manager for ERTS. Connecticut's aerospace industry was represented by the presidents of United Aircraft's two Greater Hartford divisions—Bruce N. Torell (left) of Pratt and Whitney Aircraft and Richard F. Gamble of Hamilton Standard.

TO THE EDITOR

Unnecessary Air Pollution

Goddard vehicles are frequently parked with their engines running while the drivers are making deliveries or conducting other business. Even during the recent air pollution alert, a station wagon was parked in front of a building with its engine running.

Please shut off your vehicle (whether Goddard or private) when you are parked. The slight convenience of not having to restart the engine does not warrant the added air pollution. It has been shown that idling cars produce more pollution than cars running at highway speed. This is the reason the Massachusetts' motor vehicle code prohibits running a vehicle's engine if that vehicle will be stopped for a foreseeable period of five minutes or more.

Also, please do not leave your vehicle running to keep the air conditioning or heater on.

--Bob Turkelson
Code 626

Looking Ahead for Comet Watchers

What promises to be one of the most spectacular comets of the century is presently streaking towards the sun at a speed of 53,000 miles per hour. Named Kohoutek after Lubos Kohoutek of Germany's Hamburg Observatory who discovered it last March, the comet will pass closest to the sun on December 28, 1973. Kohoutek will be brighter than Haley's Comet which will return in 1985, and some scientists predict it will be at times as bright as the moon with a tail that may extend across one sixth of the night sky.

Kohoutek will also be the most thoroughly studied comet in history. One of the most intensive Kohoutek projects is being conducted by NASA under the direction of Dr. Steven P. Maran, of Goddard's Laboratory for Solar Physics.

Dr. Maran, head of "Operation Kohoutek" says "It's the first comet we've ever had an opportunity to study so close up with space-age equipment. This includes manned and unmanned spacecraft, sounding rockets, aircraft and ground-based high-power cameras and telescopes — all of which will be trained on the comet. Space instruments will study ultraviolet and infrared light of the comet, while ground telescopes record its visible energy. We would like to know more about cometary origin. Are they out of the original solar system nebula or interstellar matter captured by the sun?"

Amateur astronomers who plan to view the comet are urged to be careful while it is near the sun since looking at the sun can result in permanent eye damage. While binoculars and small telescopes are useful when a comet is dim, the naked eye is best when it gets bright.

To photograph the comet, use a tripod for stability, set lens wide open and use infinite focus. Use fast color or black and white film (ASA 500) and try several exposure times from a few seconds up to a minute. Try to include foreground objects such as trees or rooftops in the picture so that size comparisons can be made.

The following chart is based on information drawn up by Dr. Donald Yeomans of the Computer Science Corporation in Silver Spring, Maryland.

Visibility of Comet Kohoutek in Washington, D.C.

Comet Is a Morning Object

Local Standard Time (a.m.)

DATE	COMET'S HEAD RISES	TWILIGHT BEGINS	SUNRISE	COMMENTS
Nov. 14	3:31	5:15	6:50	Comet rises tail first in ESE morning sky. Might seen by binoculars.
Nov. 22	3:44	5:23	6:59	Comet rapidly brightens to possible naked eye object. Tail will rise 1 hour prior to head.
Nov. 30	4:08	5:30	7:07	
Dec. 4	4:26	5:33	7:11	
Dec. 8	4:49	5:37	7:15	Comet head becomes smaller while tail continues to grow.
Dec. 12	5:15	5:40	7:18	
Dec. 16	5:45	5:43	7:21	Comet visible in early phase of morning twilight.
Dec. 20	6:18	5:45	7:23	Comet should be visible in early SE morning twilight.

Dec. 21	6:52	5:46	7:25	Comet visible west of sun in morning twilight. From Dec. 24 through Dec. 31 it is within 10 degrees of sun.
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Comet Is a Evening Object

Local Standard Time (p.m.)

DATE	SUNSET	TWILIGHT ENDS	COMET'S HEAD SETS	COMMENTS
Dec. 28	4:53	6:27	4:53	Comet passes closest to sun. It rises and sets approximately with sun.
Jan. 1	4:56	6:30	5:53	Comet may still be a daylight object following sun and should be magnificent in SW twilight with tail extending up from horizon.
Jan. 5	4:59	6:33	6:38	Comet bright in WSW in twilight and after. Jupiter, Venus and Comet aligned.
Jan. 9	5:02	6:36	7:22	Nearly full moon rises in east; comet in West-South-West. Tail shortens and dims with each passing day.
Jan. 13	5:07	6:40	8:06	Jan. 10 through 20 best for photography as comet is higher above the horizon after twilight and moon is waning.
Jan. 17	5:11	6:43	8:48	
Jan. 21	5:15	6:47	9:25	Comet still may be naked eye object in twilight and after.
Jan. 25	5:20	6:51	9:58	
Jan. 29	5:25	6:55	10:25	Comet tail shortens and head grows dim.
Feb. 6	5:34	7:03	11:00	Binoculars and small telescopes useful.
Feb. 14	5:43	7:11	11:18	Comet reaches highest altitude at mid-month.

ANNOUNCEMENT

IRIG Telemetry Standards Available

The most recent edition of the telemetry standards and test methods published by the Telemetry Group of the Range Commanders Council are now available. These documents, which deal with Department of Defense test range telemetry standards for transmitters and receivers, radio frequencies, frequency division multiplexing, time division multiplexing, instrumentation magnetic tape, instrumentation recorders/reproducers, and transducers, should replace earlier editions of the IRIG Telemetry Standards (the most recent editions are IRIG 106-71 and 118-71). The newly issued documents contain both metric and conventional units.

Copies may be obtained from Mrs. Norma C. Bowen, Code 520.2, extension 4592. Request: IRIG Telemetry Standards, Document 106-73; IRIG Test Methods for Telemetry Systems and Subsystems, Document 118-73. These companion were revised May 1973 documents and should be used together.

These standards are made available for information and background to interested personnel. They are not necessarily applicable to NASA projects. Data Systems interfacing with Goddard facilities must conform to the Goddard Aerospace Data Systems Standards which are also available from Mrs. Bowen.

Combined Federal Campaign

The 1974 Combined Federal Campaign got underway on October 1 and will continue through November 9. The overall goal this year is \$9.2 million. The figure was set by the Fund Raising Program Coordinating Committee of the National Capital Area made up of Federal agency representatives and employee organization leaders. Goddard's share is \$175,000.

The CFC provides funds for over one hundred health and welfare agencies, which are briefly described in the brochure available from your keyman. These charitable organizations hold out the helping hand of the volunteer in providing an array of services to older people, to youths, and those who are ill. It is an opportunity for all of us to share in a common humanitarian cause.

Our CFC contribution is directed to all participating agencies, unless, of course, we designate a particular agency. In such a case, an agency receives all of the designated dollars, even when they total more than the campaign goal. So, we do have the option of directing our contribution.

The organizations involved in the CFC need our support. Any one of us may someday find that he needs help. It will be available because his neighbors contributed their Fair Share.

If you have already contributed to the Combined Federal Campaign, you may take pride in the fact that you have lived up to the tradition of generosity and concern that has been the hallmark of the Federal service. Our combined gift will help many.

If you have not yet contributed, do it today. And do it the most convenient way—through the payroll deduction plan.



SECURITY'S "little red schoolhouse" is now white. Workmen recently completed the installation of aluminum siding to give the Security Branch Headquarters a face lift. On the steps of their new white house are (from the top) James Ritz, Maie Randolph, Pat Mattia, Connie Brown, Head of the ID Section; Mary Morrissey, Terri Tull, Elaine White, and Chris Bryan, Head of the Security Branch. The building is divided into two sections with the main offices on the top floor. The section for car and personal identification passes can be reached through the parking lot entrance in the rear.

People Keep GEWA Going

People who give freely of their time and talents are the key ingredient in the success of the Goddard Employees Welfare Association (GEWA). Established in 1960 to foster the social, athletic, educational, cultural and welfare interest of all Goddard employees, GEWA is an organization for and by people.

The association is administrated by an Executive Council which is comprised of one employee from each directorate and one from the Director's Office.

The council is responsible for the business and financial management of a wide-range of services including a retail exchange store, recreation facilities, vending facilities, cafeterias, and dining areas. To assist in making administrative decisions, there are three standing committees: the Clubs Council Committee, the Facilities Committee, and the Food Services Committee.

Most of the income for the operation of GEWA is derived from the concession agreement with the cafeteria and vending contractor. This guaranteed minimum commission is \$50,000 per year. Additional income is derived from the exchange store and the sale of items like eggs, flowers, books, etc.

GEWA has provided the capital funds for building of the Recreation Center, baseball fields, tennis courts, and many other club facilities, and to purchase the cafeteria equipment and furniture for Building 1 and 21. The Executive Council has always considered the Recreation Center as the major and distinctive interest and source of welfare to the majority of employees (last year over 30,000 employees used the Rec Center). Therefore, considerable funds are allocated for its upkeep and improvement.

GEWA also sponsors some 38 clubs with more than 3,700 club participants. GEWA considers capital investment assistance to the club needs. All clubs are now self-sufficient on an operational basis. Other sponsorships are Directorate Funds (\$1.50 per person) and the newly opened GEWA (managed by Mrs. Laura James x4498) ex-

change store which offers a variety of discount articles and services. Clocks are given to retirees. Non-interest loans are also made to clubs for such purchases of a sailboat, a flight training simulator, improvement of tennis courts, construction of a trap and skeet range, etc.

With the successful operation of its clubs, the development of its facilities and the equitable status of its responsibilities, the Executive Council is trying to formulate future policies, priorities, and needs. Priorities for the remainder of its fiscal year will be the renovation of the cafeterias and the maintenance of the recreation center. Future developments are presently under discussion and inputs from employees as to their wants and needs would be most welcomed by the Council.

With the efforts of many unselfish energetic employees who have given in the past and the untapped source of those who will give in the future, GEWA will be offering much more to the employees.



GEWA COUNCIL MEMBERS are (from left with their codes) Albert Fitch (300), Facilities Chairman; Bob O'Steen (200), John Quann (600), President; George Anikis (100), Second Vice President; Gil Bullock (400), Secretary; Jack Libby (700), Vice President and Clubs Council Chairman; Marc Selig (500), Food Services Chairman; Bob Miller (800), Sam Keller, Advisor, and Alberta Moran, Advisor.

A Development Program for the Whole Child

The Goddard Child Development Center located near Building 16, is beginning its fifth month of operation. Since it opened on June 4, the center has offered a full day educational program for three to five year olds whose parents work at Goddard. Thirty children can be accommodated at one time.

The center's diverse program includes a kindergarten class taught by center director Ginger King and nursery classes taught by teacher Harriet Blum and her assistant Linda Blackstone. All three teachers are accredited by the State of Maryland in early childhood education. Teaching aids are recruited from the ranks of students in early childhood education at local colleges and universities. The center is used by the University of Maryland for the training of student teachers, who add a valuable dimension to the teaching program.

The center's operational budget is totally dependent on tuition payments made by the parents, who also provide lunch each day. The center provides milk with lunch, as well as two nutritious snacks.

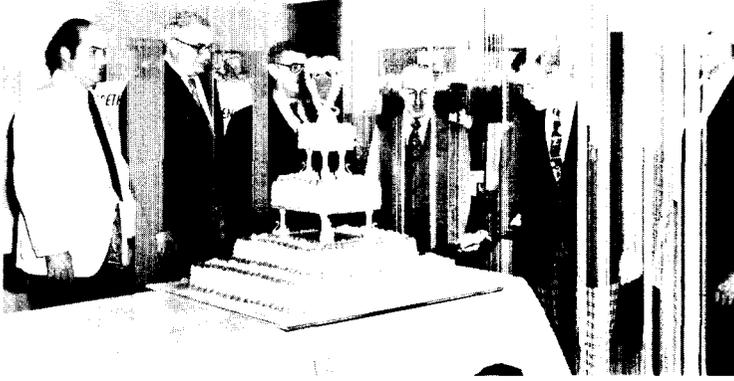
The educational program follows a child development approach which is concerned with the whole child — his physical, social, emotional, and intellectual growth, and which recognized the ways in which children deal with information and concepts. The children are actively involved in manipulative and exploratory activities, with strong emphasis on individual choice. Each teacher provides stimulative and suggestive material, direction, support and verbalization. Children need time to reflect as well as to act, and every effort is made to permit them time and place to be alone. Learning is seen as a growth process rather than a collection of facts, and the uniqueness of each child is viewed as an asset to be enhanced, rather than as an obstacle to be overcome.



THE BOARD OF DIRECTORS of Goddard's Child Development Center meet to discuss the center's program. Clockwise from left are Lynn Murphy, Treasurer of the Day Care Club (DCC); Barbara Wax, DCC Vice President; Pat Comella, Member at Large; Ann Merwarth, DCC President; Ginger King, Director of the Child Development Center; and Gretchen Burton, DCC Secretary.



Children's photos by Tom Mengel



THE CU IS 24. To open the year of its Silver Anniversary, the Credit Union held a birthday party in the Building 21 Cafeteria assisted by Goddard Director Dr. Clark and the Credit Union Board of Directors. At the cake cutting ceremony are (from left) Gary Isner, Goddard CU Branch Manager; Sam Tarlton, Don Premo, Tony Rossi, Dr. Clark, and Joe Dunst, President of the CU Board of Directors. The NASA Washington Federal Credit Union was created on September 29, 1949 to serve the employees of what was then NACA—the National Advisory Committee for Aeronautics. In the Beginning, the Credit Union was run by volunteer workers who would take payments and deposits in their spare time. Thanks to their dedication and the dedication of others since then, the Credit Union has grown to three branch offices at Goddard, NASA Headquarters and the accounting office; two service centers at Iverson Mall and Wheaton, nineteen employees, and assets of better than twelve million dollars.

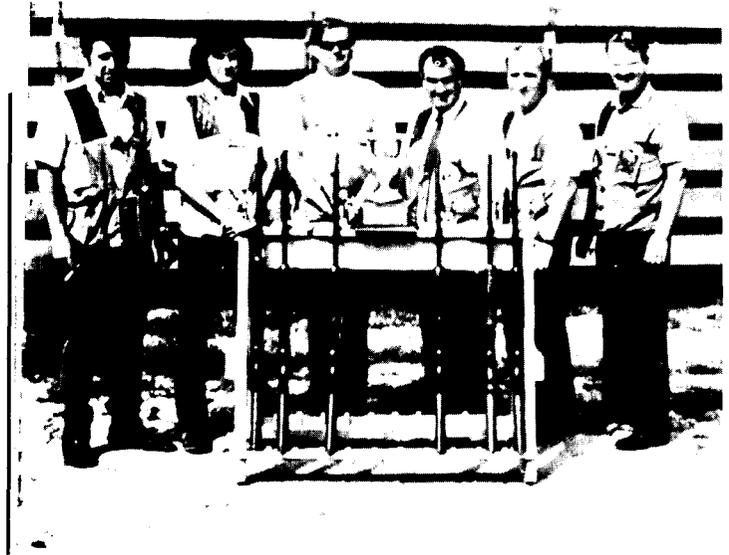
South Pacific



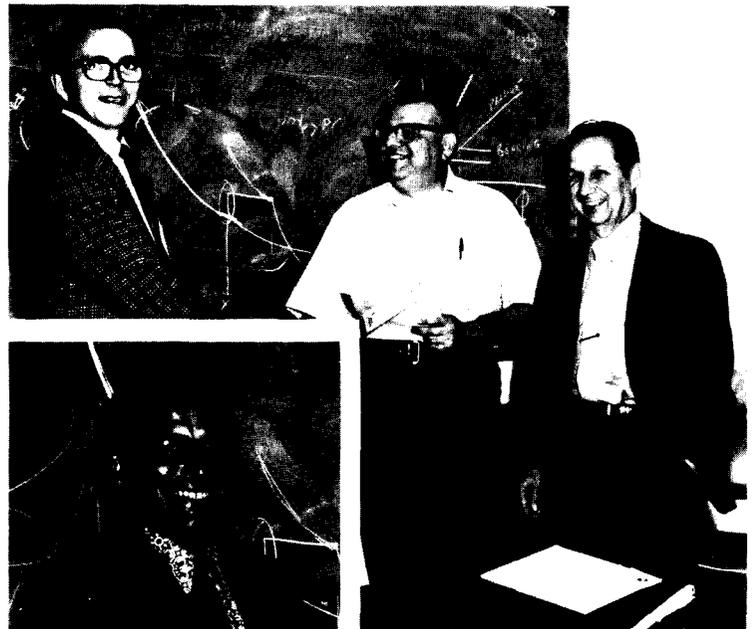
MEMBERS OF THE CAST of MAD's fall production, South Pacific, invite you to an evening of dinner theatre during the first three weeks of November. The play will be presented eight times—on November 2, 3, 5, 9, 10, 13, 16, and 17—and dinner will feature dishes from Hawaii and the islands. Welcoming you above are (from left, front row) Dick Finnblade, Lou Walter, Arlene Dennis and John Quann. In the Second row are Agnes Smith, James McChesney, George Pieper and Doris Clemons. Standing in the back row are Jack Libby, June Pennoyer, Chuck Wende, Sandy Walter, Sandy Sadowsky, Bea Buccucci, Bill Pruitt, Barbara Walton, Gene Smith, Daren Lee and Vince Aurillo.



THERE IS NOTHING LIKE A DAME! The male chorus of South Pacific rehearse one of the many rousing songs from the play. For ticket information contact Laura James in the GEWA Building 98 or call her on extension 4498.



SHARPSHOOTERS. Goddard's Trap Team won the 1973 Federal Trap League competition held last summer. The winners are (from left) Wesley Willard, Donald Ketterer, Walter Carrion, Louis Caudille, Team Captain; Timothy Carrion, and Paul Spadin.



BENJAMIN ZIMMERMAN (left) and James Donohue (inset) receive a cash award for a patent from Moe I. Schneebaum, Chief of the Earth Observations Systems and Systems Engineering Division. Looking on is Henry C. Hoffman, Head of the Stabilization and Control Branch. Mr. Zimmerman and Mr. Donohue, both of the Stabilization and Control Branch, received the award for a patent entitled "Passive Dual-Spin Misalignment Compensators." Dual spin spacecraft such as OSO, ITOS, AE and INTELSAT exhibit sinusoidal vibrations resulting from minor misalignment of rotor axis. This patent is a passive mechanical resonator on the despun portion of the spacecraft which automatically cancels out the effects of the rotor misalignment.

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