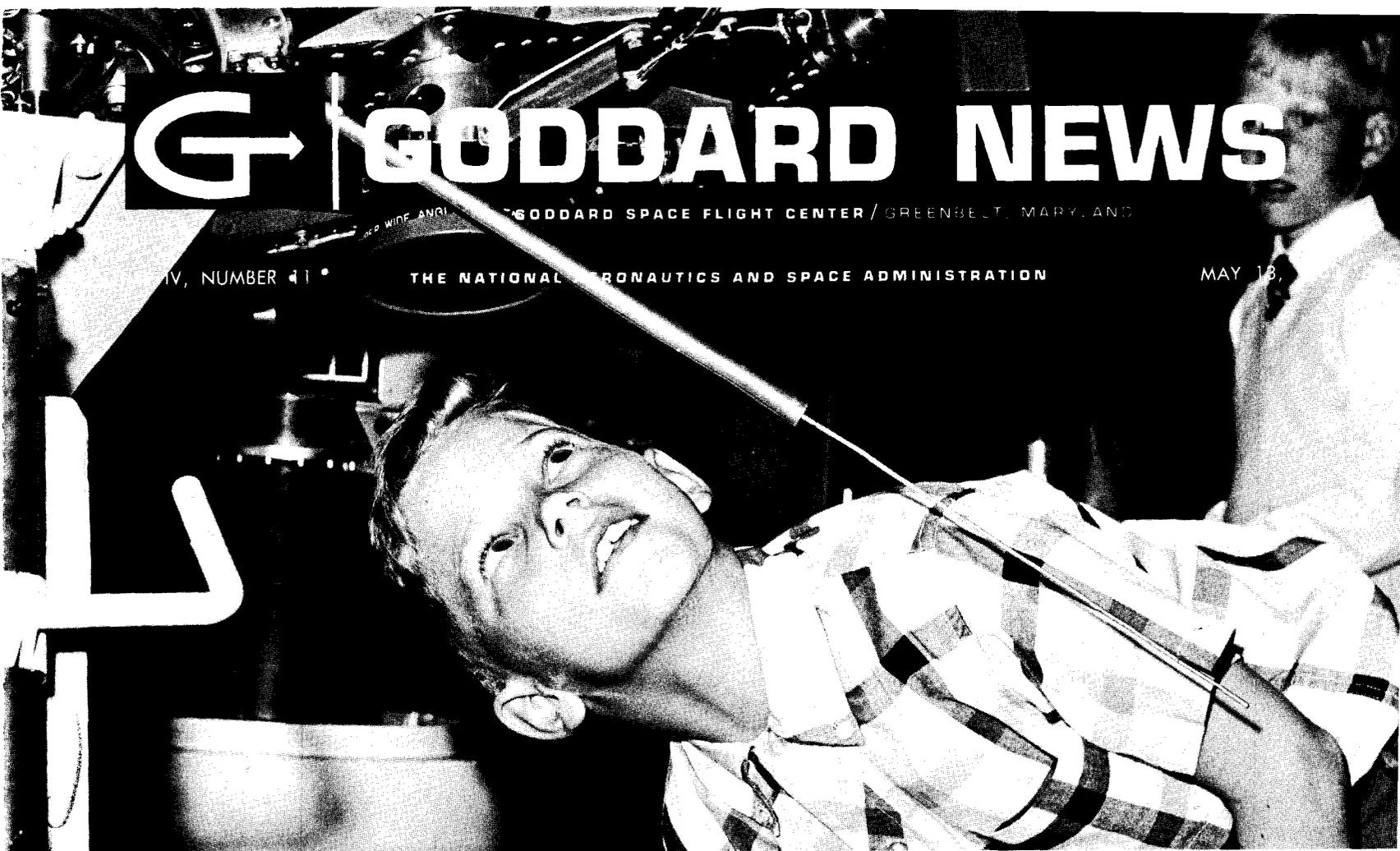


G → GODDARD NEWS

IV, NUMBER 41

THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

MAY 18,



Greg Hutchison isn't especially wide-eyed over the mast head of the Goddard News. It's the wide-angle camera on the Tiros meteorological satellite that caught his attention during Goddard's recent open house. Greg's father, Don Hutchison, is chief of the technical information division. Additional open house pictures on pages 4 and 5.

Telstar II Joins Relay; 17th for Delta

Telstar II, the fourth experimental active repeater communications satellite launched by NASA, was fired successfully into orbit last Tuesday.

Telstar II joins Goddard's Relay, the only other active repeater communications satellite now successfully performing and transmitting communications between the U.S., South America and Europe. (See Relay Success Story, this page.)

The 175-pound payload went into an apogee of 6,750 miles, nearly twice as great as Telstar I, and a perigee of 608 miles. It is orbiting the earth every 3 hours and 45 minutes, a mere 4 minutes off the planned orbital period. Inclination of the spacecraft to the equator is 42.7 degrees.

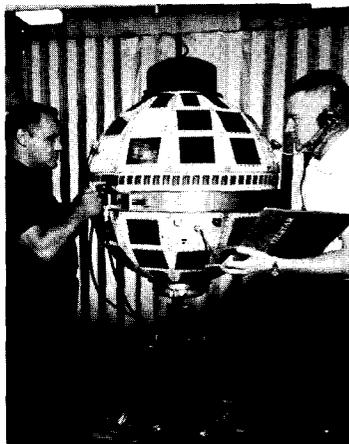
Launch was accomplished by NASA's reliable 3-stage Delta rocket, which recorded its seventeenth successive performance without a mishap. Again directing the successful launch were Goddard's field projects branch at Cape Canaveral, under Bob Gray, and Goddard's Delta manager, Bill Schindler. Telstar project manager for Goddard is Charles P. Smith.

First communications test between the Andover, Me.,

ground station and Europe, via the spacecraft, produced a picture "steady and clear."

Telstar launches are unique in that a private industry—the Bell Telephone System—builds the satellite and reimburses NASA for the cost of launching.

Bell's Telstar I, launched last July, functioned almost perfectly in the initial weeks of its orbit. It was used extensively for trans-Atlantic television, telephone, radio and picture facsimile transmissions.



Bell Telephone technicians check communications transponders on Telstar prior to launch.

NASA Relay Compiles Array of 'Firsts' In Impressive Five-Month Performance

Five months ago today—Dec. 13—was not an especially bright one for Goddard's Relay team. Although Relay was launched successfully, an abnormal drain on its power supply caused NASA's first low altitude repeater communications satellite to experience a severe drop in voltage.

Today, after 5 months of professional nursing at the hands of patient Goddard engineers, Relay has responded with amazing success to the skillful direction of its earth-bound doctors.

All of its missions, including testing intercontinental microwave communications, measuring energy levels of space radiation and determining radiation damage to solar cells and electronic components, have been successfully performed.

Figures compiled by Norm Miller, assistant to the Relay project coordinator, indicate an impressive list of successful Relay "firsts" in experiments and demonstrations conducted with the spacecraft.

Impressive Achievements

After 1,083 orbits of the earth, the list looks like this:

137 hours of successful wideband transponder operations covering wideband and narrowband demonstrations, and 629 wideband and 230 narrowband experiments. Narrowband consists of two-way telephone, teletype and picture (black and white, and color) transmissions. Wideband consists of television and multiplex channel one-way transmissions. Forty different experiments are conducted which furnish quantitative data needed for evaluation of the systems abroad, including measurements of intermodulation, noise, cross talk, channel performance, etc.

"Communications experiments are not always conducted under ideal conditions," said Joseph Berliner, Relay project manager. "Some are performed when the satellite is closest to the earth and picking up increased noise and others when it is farthest away and sending only a faint signal. Experiments also are conducted under varying conditions of weather, attitude of the spacecraft, temperature, horizon and zenith angles, and night and day."

(Continued on page 2, col. 1)

Redundant Systems Major Reason for Relay Success

(Continued from page 1)

Public demonstrations include the more popular 1-way transmissions of TV pictures and test patterns, and 2-way telephone calls via the Relay satellite. (The tabulated box lists highlights of some of the more well known Relay demonstrations).

Success Factors

Success of Relay is attributed by Mr. Berliner in a large degree to the redundant systems aboard the spacecraft, a feature not present in other communications satellites. Relay carries two identical wide-band transponders for reliability, so that in the event one fails the other can carry out the communications experiments. In addition, the command system has 2 command receivers and 2 decoders. However, control operation of all systems in the spacecraft is accomplished through only 1 receiver and 1 decoder. For each command sent, the message or code is repeated 5 times.

A number of other factors are responsible for Relay's outstanding performance, Mr. Berliner said. He listed proper planning, on the spot analysis of telemetry data, followed by thorough operational control as contributing factors.

Telemetry data are separated into 3 categories or classes. Class 1 consists of 11 items which indicate spacecraft conditions which determines go or no-go decisions. These are de-



Bob Gray, Reggie Vietor and Mary Brammer of Goddard's field projects branch at Cape Canaveral talk to Goddard via Relay. Three other separate but simultaneous telephone conversations also were in progress. (See orbit 363 in box)

commutated and displayed for real-time evaluation during an orbit pass. Six of the items are further processed to provide signals through a limit checker. The checker indicates by a red or green light when any of the items are exceeding their expected limits.

Class 2 data consists of 39 items covering spacecraft performance, radiation measurements and command verifications.

Real-Time Evaluation

The real-time reduction of many spacecraft performance measurements becomes the significant operational tool for experimental satellites, said Mr. Berliner.

"We can get performance data in real-time while critical

functions continue on the spacecraft. This also enables the correction of anomalous command states if they should occur, as well as allowing real-time verification that the transmitted commands successfully reached the spacecraft."

Mr. Berliner said that the recent use of Relay for sending "brain waves" from England to Minneapolis, Minn., could open up unlimited opportunities for more widespread use of communications satellites, particularly in the processing of many kinds of medical data. In the future, he said, it may be possible to exchange the best medical information available among experts located in widely separated places, and to obtain medical diagnoses within minutes, i.e., in real-time.

Delta Users Meet, Discuss Increased Use of Vehicle

Everyone likes a winner, whether on the football field, the political arena, or the Broadway stage. And it's proving to be no different for space age rocketry.

After seventeen successful launches in a row, NASA's top-notch Delta launch vehicle finds it's as popular with a space engineer as a Big Ten champion is with the quarterbacks on High street.

To properly work out some of the problems expected from the increased demands for use of the Delta vehicle, an estimated 80 representatives of government and industry got together at Goddard a week ago for a special coordination meeting. Their purpose:

- to find out what requirements future spacecraft expect from Delta,

- to determine how these spacecraft can be tailored to meet compatibility requirements of the rocket, and

- to explore how the vehicle can be improved to accommodate expected bigger payloads.

On hand for the working-group session were representatives of the upcoming Goddard spacecraft due to be launched by Delta — Tiros G, Syncom-2, Relay B, OSO (S-17), IMP (interplanetary monitoring platform), S-6a and S-3c. Also present to discuss six possible new missions for Delta were project staff members of the Pioneer and Biosatellite, from Ames Research Center; Sert III (space electric rocket test), from Lewis Research Center; ISIS (international satellite for ionospheric studies), from Canada; the Tiros eccentric meteorological satellite and Anna, both from Goddard.

Increased Performance

Special emphasis was given in the sessions to improving the performance of the Delta, which will result in "greater payload carrying capabilities," according to Tony Brozena, Delta payload coordinator.

"The high reliability and relatively low cost of the vehicle are especially attractive to many potential users of the Delta," said Mr. Brozena. "We believe the meetings will help us to better accommodate both the present and the new users of the vehicle."

(Continued on page 6, col. 1)

Relay—A Vital Link Between Three Continents

A Sampling of Major Demonstration Successes

Orbit	Date	Event
207	Jan. 9	Live and Taped TV program of Mona Lisa ceremony transmitted to Europe
208	Jan. 9	Facsimile pictures of Mona Lisa opening transmitted to Europe
222	Jan. 11	England received teletype transmission from U.S. and Brazil
254	Jan. 15	2-way telephone conversation between U.S. and England looped 3 times via spacecraft
262	Jan. 16	2-way telephone and teletype with France
267	Jan. 17	USIA program in Spanish, English, Portuguese transmitted to Brazil
275	Jan. 18	President Kennedy, Dr. Dryden send teletype and recorded voice messages, respectively, to Italy
285	Jan. 19	TV video tape of Premier Fanfani Chicago visit transmitted to Italy
363	Jan. 29	4 separate, simultaneous 2-way telephone conversations between D. C., Tex., Calif., Md., and Fla.
440	Feb. 8	Telephone conversation in German and Japanese with Hamburg and London
602	March 1	High-speed teletype transmission of 1 million bits to Italy without error
663	March 9	Telephone talk between Astronaut John Glenn and London Daily Mirror science editor R. Bedford
741	March 19	Special signal successfully routed through Relay 12 times
749	March 20	RCA color loop test of Walt Disney Show
827	March 30	2 simultaneous telephone conversations from Brazil to U. S. and, via land line, to Japan
910	April 9	Live telecast from White House to Europe of Winston Churchill honorary citizenship ceremonies
1035	April 25	Transmission of electroencephalograms ("brain waves") from Bristol, England, to Minneapolis, with results interpreted and transmitted back. Simultaneous color facsimile transmitted to England.

Largest Space Simulator Now in Use by Test and Evaluation Division

After months of testing and thorough observation, Goddard has made final acceptance of the thermal vacuum portion of its largest space environmental simulator. The chamber's solar intensity capability is still under construction.

Thermal vacuum facilities section personnel are presently in training, learning to operate all pertinent systems, according to section head Thomas Hollingsworth. The new simulator, located in building 10, has a working volume diameter of 27.5 feet. Its useable height is 38 feet.

Capabilities Listed

Previously, the largest environmental simulators had working space of only 7 x 8 feet. The new simulator has the following capabilities:

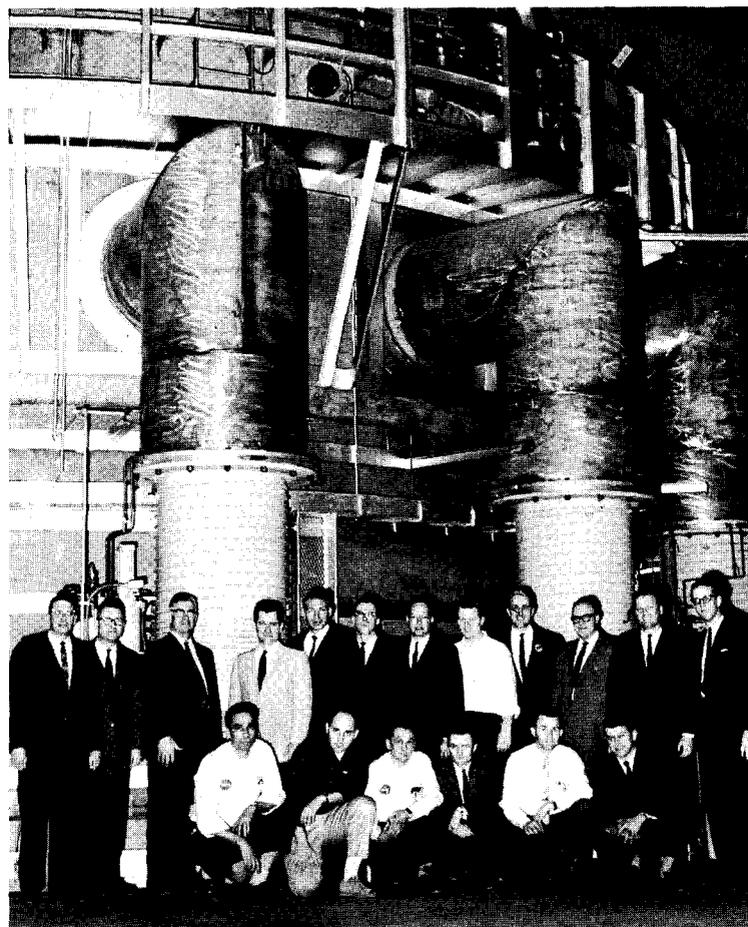
- the ability to test spacecraft of the Agena class;
- flexibility to simulate the intense cold and heat of space, temperatures from

—173° C (—280° F) thru 85° C (185° F);

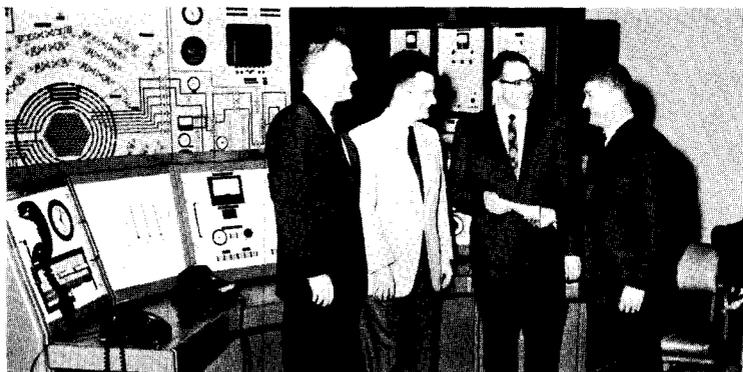
- ability to create a vacuum so great that only one molecule of air is left in a volume normally occupied by 1,000,000,000,000 molecules; and
- simulation of the energy of the sun to 135 watts per square foot—equivalent to incident solar energy above the earth's atmosphere.

"We will be coming as close as the present state of the art permits to matching the spectrum and intensity of sunlight at earth orbit," said Dan Cope, assistant project manager for the simulator.

The solar simulation capability will be ready for use late this year, and will cover an area at the bottom of the chamber 20 feet in diameter. Eventually the intensity can be approximately doubled to simulate a Venus orbit.



Some of the men from Goddard and various contractors who contributed to the finished simulator use their "baby" as a photo backdrop. Left to right, standing, are: Jerome Rothenberg, Stokes Corp.; Ronald Sheffield, Minneapolis-Honeywell; Dan Cope, engineering design branch; John Boeckel, associate chief, T&E division; Norm Wade, engineering design branch; Robert Griest, Minneapolis-Honeywell; John Engdahl, Minneapolis-Honeywell; Jack Henegar, thermal vacuum facilities; Robert Johnson, Stokes Corp.; William Conley, Minneapolis-Honeywell; Robert Doering, Minneapolis-Honeywell; and George Konnapel, Stokes Corp. Kneeling, left to right, are: Frank Cuzzolina, thermal vacuum facilities; George Giacchino, Stokes Corp.; William O'Hara, thermal vacuum facilities; Earle Young, engineering design branch; Robert Van Fleet, engineering design branch; and Albert Fuchs, procurement.



Shown here at the control console of the new simulator are (left to right): Robert Doering, Minneapolis-Honeywell; John Boeckel, Associate Chief, T&E division; Jerome Rothenberg, Stokes Corp.; and Albert Fuchs, procurement.



Eleanor Pressly, first Goddard recipient of a Federal Woman's award for outstanding government service, is honored with five other winners at the recent award's dinner. (Goddard News, April 15). Standing is Dr. Robert C. Seamans, Jr., NASA associate administrator. Seated, front row, are Andrew Parker president of Woodward and Lothrop, sponsors of the award's program; David Brinkley, NBC-television; Katie Louchheim, deputy assistant secretary of state for public affairs and chairman of the board of trustees for the woman's award, and Miriam Ottenberg, Pulitzer Prize-winning reporter for the Washington Star and member of the award's board of trustees.

Goddard Speech and Paper Presentations

(Technical presentations approved as of May 7 for period of May 13 through May 26)

SPEECHES

Aaron Temkin, Molecular & Atomic Gas Beam Conf., Univ. of Virginia, May 13-14, Charlottesville, "Summary of Scattering Research at the Theoretical Division, GSFC."

Stanley H. Way, Penn State, May 15, University Park, Pa., "Recent Developments in Electrical Engineering."

A. G. W. Cameron, Argonne National Laboratory, May 15, Argonne, Ill., "Synthesis of the Transplutonium Elements in the Stars."

Varice F. Henry, IEEE Professional Group on Microwave Theory & Techniques, May 14, Washington, D. C., "Project Relay—Progress Report."

E. J. Habib & A. G. Ferris, 1963 Spring Joint Computer Conference, May 21-23, Detroit, "Ground Operation Equipment of the Orbiting Astronomical Observatory."

W. R. Cherry, Power Sources Conference, May 21, Atlantic City, N. J., "Some Characteristics of Spacecraft Solar Power Systems."

James Donegan, IEEE Professional Group, May 21, Long Island, N. Y., "Mercury Computing Program."

C. W. McCracken, Lunar Surface Materials Conference, May 21-23, Boston, "Dust Bombardment on the Lunar Surface."



Absorbed young ladies, oblivious to the maze of scientific equipment and mass of milling adults around them, check the map: "Where do we go next?"

"And the food was fine . . ." Here a little Cub with a big appetite takes a sample of the open house food as offered by the cafeteria staff.



WOMEN AND CHILDREN FIRST:

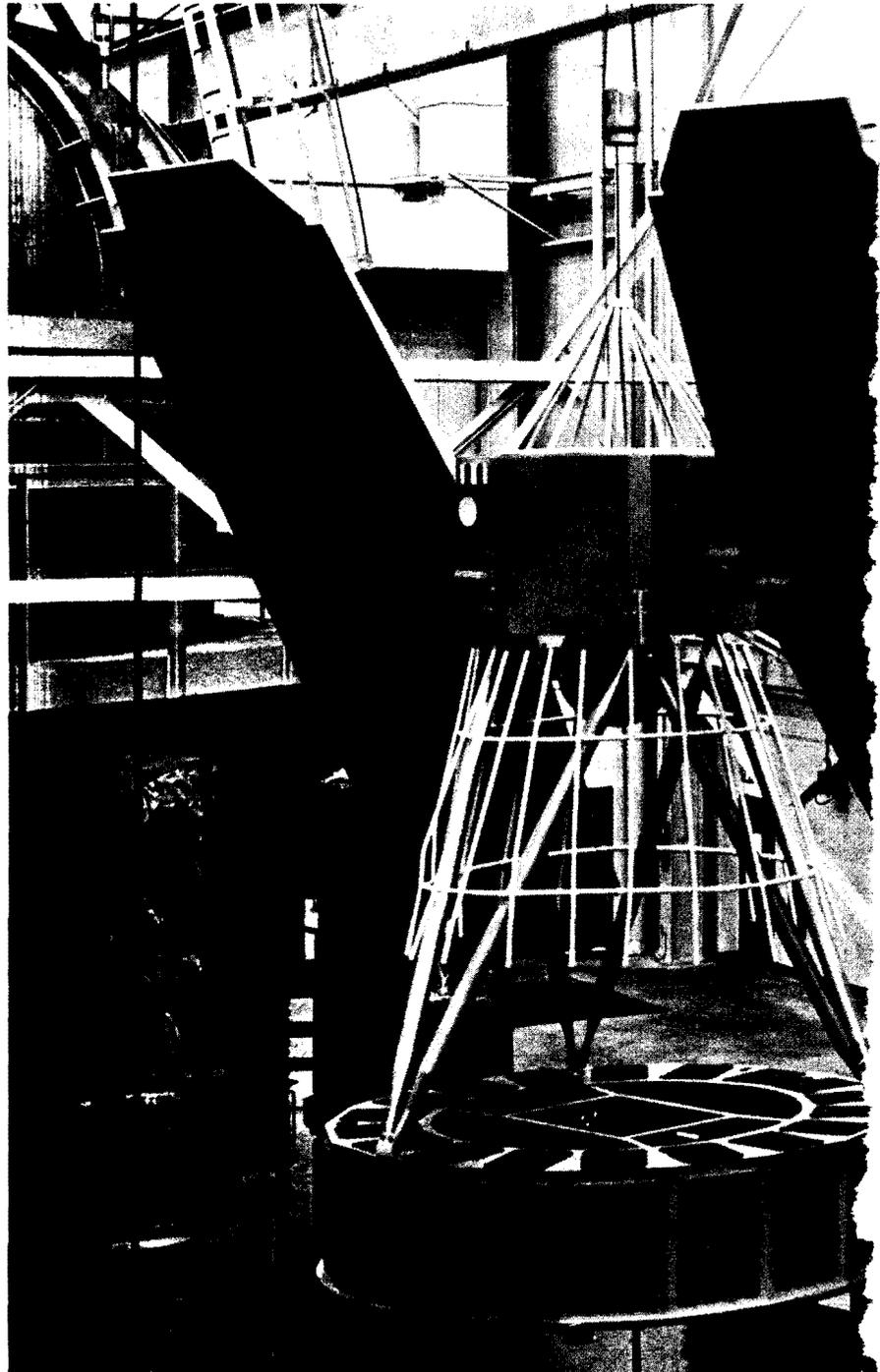
Open House Cre

Scouts were poppin' out all over! Goddard's second annual open house for employees' families and invited guests brought a multitude of Boy Scouts and Cub Scouts aboard Saturday, May 4—but even they were greatly outnumbered by "civilians," with women and children first.

More than 3,000 visitors turned out for the event: the influx came by the carload and the busload, with 959 vehicles recorded by the guards.

Most of the visitors had requested individual or group tours of the center during the last seven months but of necessity had been deferred to this Open House.

Gerald E. Griffin, public affairs office, coordinated the open



Nimbus, second generation weather satellite, is shown here suspended on the balcony from building 7 into Goddard's test and evaluation capabilities.



MAY 13, 1963

1963 Miss Goddard Crowned

"Terrific!" describes the general reaction to the Goddard Spring dance held Saturday night at the Sheraton Park ballroom.

The main attraction for the evening was to select Miss Goddard. Dr. Harry J. Goett, director, spun the wheel of fortune. While the four finalists held their breath, the wheel clicked to the photo of Merhlyn Pickett, office of technical services. Merhlyn, dressed in a beautiful blue gown, stood smiling and tearful while Dr. Goett vested her with a jeweled crown and an ermine trimmed scarlet robe. Merhlyn was then presented a sterling silver 10½" high vase inscribed "1963 Miss Goddard." Her escort was Maurice Levinsohn, chief, fabrication division.

Dr. John Lindsay, solar physics branch, held the winning ticket for the first dance with Miss Goddard.

The other finalists were, Dyanna M. Harris, space science and satellite applications, escorted by Herman E. LaGow, chief, systems review group; Linda Richardson, office of administration, escorted by Gordon H. Tyler, chief, procurement and supply division; and Diane Doss, tracking and data systems, escorted by John T. Mengel, assistant director for tracking and data systems. The girls carried arm sprays of yellow roses. Each received a sterling silver compote engraved with her name, date and "Miss Goddard Finalist."



Dr. Goett crowns Miss Goddard 1963, Merhlyn Pickett. Maurice Levinsohn, (left) assists in arranging her flowers.

Master of ceremonies, Dr. Michael J. Vaccaro, assistant director for administration had the audience of 800 in fits with his films, costumes and running comments.

When nobody wanted to go home at 1:00 a.m., Fred Perry's Glen Miller Band played another hour.

Many thanks to the Social Planning committee of the Goddard Welfare Association for such a fabulous evening!



More than 800 people crowd the Sheraton Park ballroom for Goddard's big spring dance.

Something New

With this issue, the Goddard News introduces a one-page insert called "Inside Goddard". Information of a non-technical nature, such as recreation activities, new personnel, unusual hobbies and other news of human interest to Goddard employees and their families will be featured in this new addition. With your cooperation in providing the news and photographs, we hope you will find this a worthwhile addition to the paper.

Welfare Association Obtains Land for Recreation Area

Rapid progress is being made in developing the land which was recently obtained for a recreation area to be used by Goddard employees and their families. Allen L. Franta, president of the Goddard Welfare association, said the baseball diamond should be ready for action next week.

The Recreation area has approximately ten acres to be used by Goddard employees for sports activities and social functions. A portion of this land, a pie-shaped slice on Telegraph road, was obtained from the Department of Agriculture.

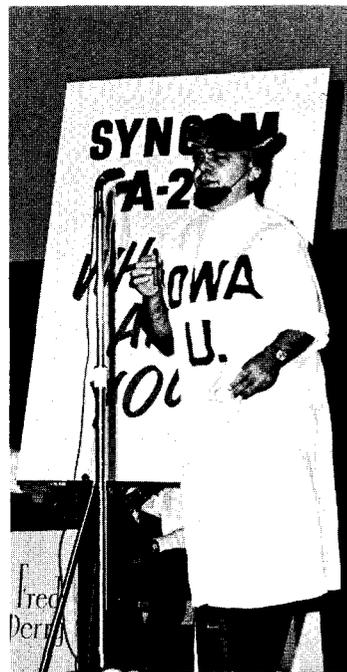
A parking lot with a capacity for 100 cars is underway, said Walter Olson, facilities engineering division. Also this month drilling will begin for a well that will provide water for the area. Sometime in August the west side of the grounds will be enclosed with 500 feet of fencing; eventually the entire area will be fenced.

Building with Fireplace

Plans for a shelter building, which the club hopes to have completed by the end of the summer months, are nearing completion. The shelter building will seat approximately 100 people. The main feature of the building will be a dual purpose fireplace with openings inside the pavilion and outside.

Long range plans for the recreation area will include tennis courts, an archery range, horse-shoes and badminton. Also plans for the future include obtaining an additional two acres for a picnic area.

The Recreation area, sponsored by the Goddard Welfare association, will be a welcome addition for Goddard sports enthusiasts.



Dressed as a beatnik scientist, Dr. Vaccaro had the audience "rolling in the aisles" with his humorous patter.

Sollars Bowls Perfect Game

The Goddard Men's league will soon end their first season—but not without recognition. The outstanding performance of Dale Sollars, design engineer in the communications branch, who early in the season bowled a perfect 300 game, will give next year's bowlers a real challenge.

Dale's feat was only the sixth such performance in the history of the Washington area and the first on Capitol Plaza alleys in Lanham, Md. For his accomplishment, Dale was awarded an inscribed diamond ring by the American Bowling Congress and cash awards amounting to \$300 by Fairlanes Capitol Plaza and the Bowling Proprietor's association.

The Men's Tenpin league was a new addition to Goddard's bowling leagues. Because of the overwhelming response the league was divided into two divisions of 12 teams each. The division winners will meet in a rolloff for the league championship the end of this month.

Officers for 1962-63 are, president, Bill Long; vice president, Joe Conn; secretary, Wednesday nights, Jocko Stitt; secretary, Thursday nights, Dick Dettmering.

GODDARD MEN'S TENPIN LEAGUE STANDINGS

Wednesday (As of May 1, 1963)		Thursday (As of May 2, 1963)	
W	L	W	L
Quiet Ones	82½ 45½	Spin-spallars	77 51
Rockets	80 48	Tartars	74½ 53½
Outcasts	75 53	Big Balls	72 56
Spoilers	70 58	A&M PM's	68 60
Woodchoppers	68½ 59½	Markers	67½ 60½
Gosobs	68 60	Fat Sparks	66 62
Missfits	61½ 66½	Old Goats	64½ 63½
Vibrators	56½ 71½	Guided Muscles	60 68
Keglers	55 73	Many-watts	58½ 69½
Holey Rollers	54 74	Hi-Lows	56 72
Solder-heads	49½ 78½	Comm-nuts	54 74
Junto	48½ 79½	Odd-Men	50 78

GODDARD MIXED TENPIN LEAGUE STANDINGS

(As of May 7, 1963)

W	L	W	L
Scatter-pins	81 47	Apaches	63½ 64½
Imps	77½ 50½	Lucky 5	62 66
Orbiting Elements	76 52	Odd Balls	60 68
Rabble Rousers	75½ 52½	Alleycats	58½ 69½
Hi-Five	73 55	Zooms	57½ 70½
Astro-gators	69½ 58½	Full House	57½ 70½
Mar-Gins	65 63	Welooze-alot	51 77
		Mogen-baiters	51½ 70½
		Bottoms Ups	45 83



New Officers for 1963-64 . . . are left to right, Rebecca Bartko, Kay Turney, Frances Isley, Jo Melendey, Mariellyn Peake, Dottie Wright, Lou Bailey, Anne Marie Hocking, Helen Timmons, Ann Nichols, Pat Nagy, Margaret Callaghan, and administering the oath of office Lois Schroeder.

Becker Wins Duckpin BVL

Goddard's Mixed Duckpin league was bound to make headlines having a bowler like Peggy A. Becker, visual arts branch. Peggy recently won a \$100 Savings Bond as winner of the annual Bowlers Victory Legion Duckpin Tournament.

Peg rolled a 113-132-151—396-78—474 to win the ladies crown. She bowled her first ball in over ten years last season—quite a comeback Peg.

The Mixed Duckpin league has some real crackerjacks. Last week Lee Murphy, accounting branch, rolled a 426 set only to have the team still lose 2 out of 3. Marie Humble, fields and particles branch rolled a triple-header strike. Not enough for an award, but that's what you call real bowling.



DALE SOLLARS, chief estimator in the construction management branch, and Bill Long, president of the Goddard Men's Tenpin Bowling league, look at Dale's 300-patch award presented to him by ABC Vice President Matthew Bennie.

GODDARD MIXED DUCKPIN LEAGUE STANDINGS

	Tuesday (As of April 30, 1963)		Thursday (As of May 2, 1963)	
	W	L	W	L
HiVacs	64	32	Countdowns	53 43
Toppers	59	37	Tick Tocks	52 44
Bluffers	57	39	Wombats	51 45
Alley Catz	57	39	Woodchoppers	50 46
Quicksilvers	52	44	Satellite	46 50
No Accounts	50	46	Starliters	45 51
Comets	50	46	Strikers	45 51
Bob Cats	49	47	Space Katz	41 55
Thunderbirds	48	48	Moon Pilots	40 56
Ducklings	47	49	Astronauts	40 56
Sam & Friends	46	50		
Alley Nauts	45	51		
Vagabonds	40	56		
Rockets	26	70		

Goddard Wives Club Installs New Officers

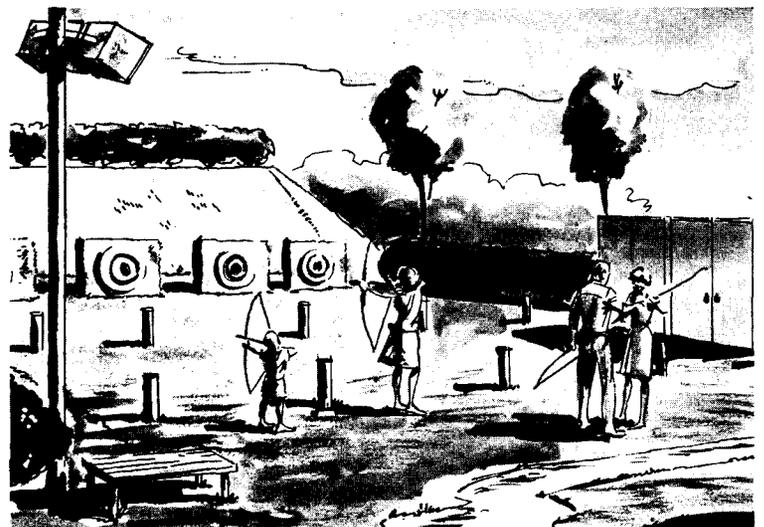
The last meeting of the 1962-63 year for the Goddard Wives club marked the beginning of a new year for the new officers.

Lois Schroeder, past president administered the oath of office last Wednesday evening at Goddard. Approximately 110 members were present for the club's second installation ceremony.

On behalf of the club, Joan Mengel, program chairman for last year, presented Mrs. Schroeder a silver tray for a job well done as the first president of the Goddard Wives club.

The new officers for the coming year are as follows: President, Margaret Callaghan; 1st Vice President, Pat Nagy; 2nd Vice President, Ann Nichols; Treasurer, Helen Timmons; Recording Secretary, Anne Marie Hocking; Corresponding Secretaries, Lou Bailey and Dottie Wright; Counselors, Jo Melendey, Mariellyn Peake and Lois Schroeder; Nominating Committee, Kay Turney (chairman), Rebecca Bartko, Betty Egarter, Frances Isley and Peggy Rochelle.

Archery Club Awaits New Range at Recreation Site



Artists concept of archery range.

For the past two seasons, the Goddard Archery club has been using a temporary range, located behind the Butler buildings on the power line. Club members are anxiously waiting for their permanent range that will be located at the Recreation club.

Goddard employees interested in obtaining a group discount on archery equipment can contact C. F. Showalter, ext. 4493. For further information concerning range facilities and group activities, contact R. J. Bush, ext. 4786 or B. J. Brogan, ext. 4502.

crowd Tops 3,000

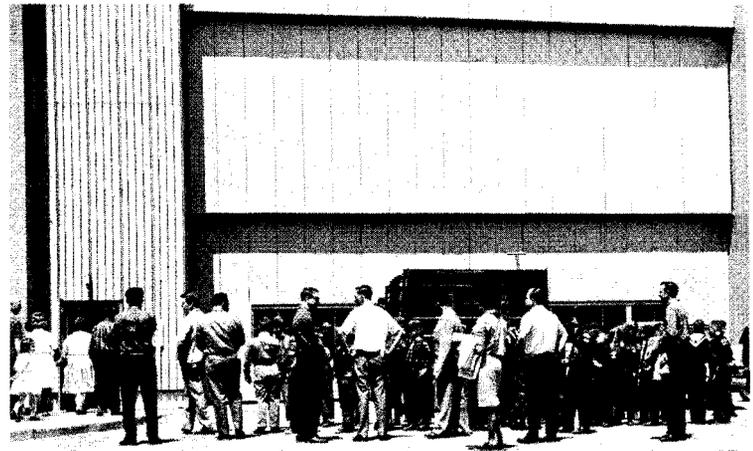
house from a control center in building 1. Crowds were directed to areas of lightest traffic by walkie-talkie.

Amazed children, picnicking knots of uniformed Scouts, and bug-eyed small boys with loaded trays in the cafeteria all added to the holiday spirit of the event—and helped disseminate the message of Goddard to thousands of wondering children and hundreds of curious spouses.

An old adage, "a (good) picture is worth a thousand words," applies well to Goddard's open house. Ron Craig and Bill Smith, Jr., of the photographic branch had a field day during open house, with the results displayed—standing in for thousands of words—on these facing pages.

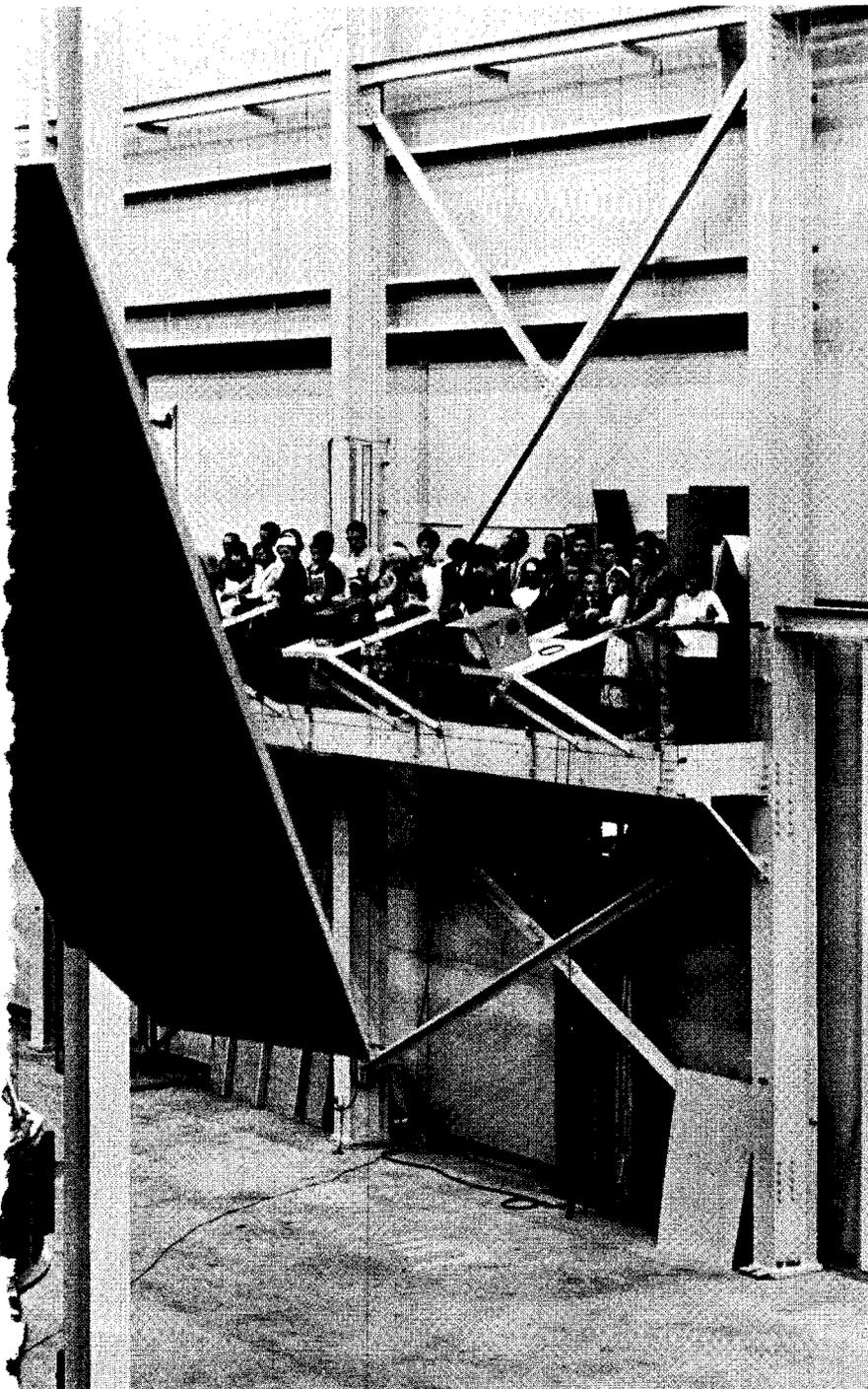


The encased relief map of the center, in the lobby of building 1, attracts special attention from the littlest daughter, whose mother points out items of interest.



Here an entire Scout troop and assorted adult visitors wait for another section of the tour of building 5 to begin. Most of the boys were amazed by the size of the "garage doors."

Two visiting Cub Scouts are intrigued by a nutation damper, used to help stabilize the recently orbited Explorer XVII.



next to the large space environmental simulator in building 10. This position, and were briefed on the sight that demonstrated God-

(DELTA, from page 2)

Making presentations were Dr. Joseph Siry, Ed Kirchman, John Neilon, Don Sheppard, Bill Schindler, and Tony Brozema of Goddard; T. B. Norris, NASA headquarters; and Jack Kline and Morris Brimer, Douglas Aircraft. R. U. Hofstetter and Carlton Bioletti of Ames and Robert Nunamaker of Lewis reviewed the Pioneer, Biosatellite and Sert projects, respectively. R. K. Brown of Canada and Dale Nelson, Goddard project manager, reviewed the ISIS program. Dan Mazur, chief of the spacecraft systems and projects division, welcomed the group.

Tracking Network Is Set for MA-9

At press time, preparations for the sixth United States manned space flight, Mercury-Atlas 9, were under way. The flight will be attempted no sooner than tomorrow with Astronaut L. Gordon Cooper at the controls.

Goddard's worldwide mercury tracking network, including 19 land stations and 4 ships at sea, were poised in readiness to monitor the flight, with the space computing center in building 3 prepared to make trajectory computations.

During the flight, information is expected to pour into the computing center from the tracking and ground instrumentation points at the rate of 1 thousand bits per second.

Goddard Coming Events

Goddard colloquium lectures:

- May 17, 3 p.m., Auditorium, Bldg. 3—Prof. L. Waltjer, Physics and Astronomy Department, Univ. of Maryland. "Physics of Radio Sources."

- May 24, 3 p.m., Auditorium, Bldg. 3—Dr. S. Fred Singer, Director, National Weather Satellite Center, U.S. Dept. of Commerce, Weather Bureau, Wash., D.C. "What is New in the Exosphere."

Lecture:

- May 16, 11 a.m., Presentation Room, Bldg. 7—Frank J. Quinlan, Honeycomb Co. of America, Inc., "Basic Raw Materials and Fabrication of Bonded Sandwich Panels and Assemblies."

Misc:

- On Thursday, May 16 there will not be a film program in the auditorium. The next scheduled program will be Thursday, May 23, 12:30 p.m., Auditorium, Bldg. 3—"Ariel 1."

Beachhead Gained in Dust Battle-Building 7

The test and evaluation staff may at last have gained an important beachhead in a constant battle against dust particles, some as small as bacteria. A complete vacuum cleaning job was completed in April on the entire interior of building 7—with every exposed surface subject to either suction or the swift swipe of a treated cleaning cloth.

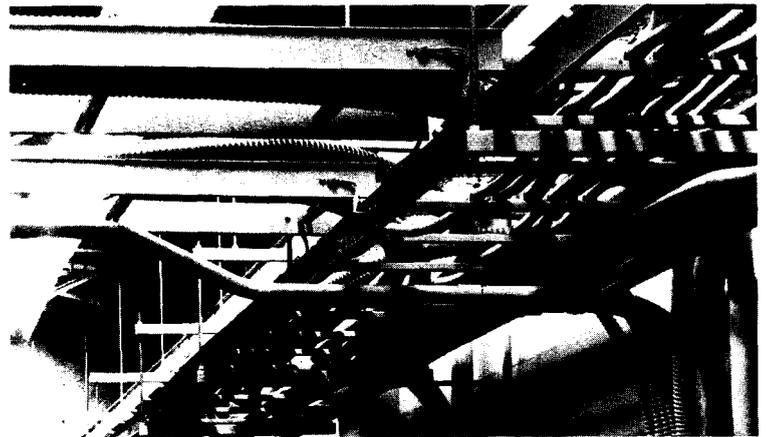
Known and controlled temperature, pressure and dust content conditions are of utmost importance in accurately predicting the effect of these factors on both measuring instruments and on spacecraft performance—and in controlling these effects.

Operations section head, James Diggins, who was in charge of the job for T. & E., stressed the need for extremely clean and dust free surroundings in buildings 7 and 10. The latter will undergo a complete vacuum treatment later this summer.

"The spacecraft which are tested in these areas are often extremely sensitive to airborne dust. A particle of only 5 microns, approximately the size of some bacteria, can do major damage to a solar cell, for example.

"The presence of any foreign matter may be detrimental to both precise measuring instruments and to the performance of spacecraft being tested. This same foreign matter can be harmful to the spacecraft in flight.

"Therefore it is necessary for



Wires, pipes, beams and fixtures in the basement corridor under the laboratory areas of building 7 were a nightmare to clean, but every exposed surface was purged of dust and dirt during the recent vacuum cleaning of the entire building.



Jim Diggins, test and evaluation division, takes note of two posters—part of a long line of art work designed to help keep down the dust in building 7.

us to attempt to achieve maximum quality and reliability by reducing or eliminating all possible sources of contamination. Dust is one of the major sources."

And how big was the job? Big enough to keep a dozen

professional cleaning men busy for 12 work days, utilizing the latest in commercial cleaning equipment.

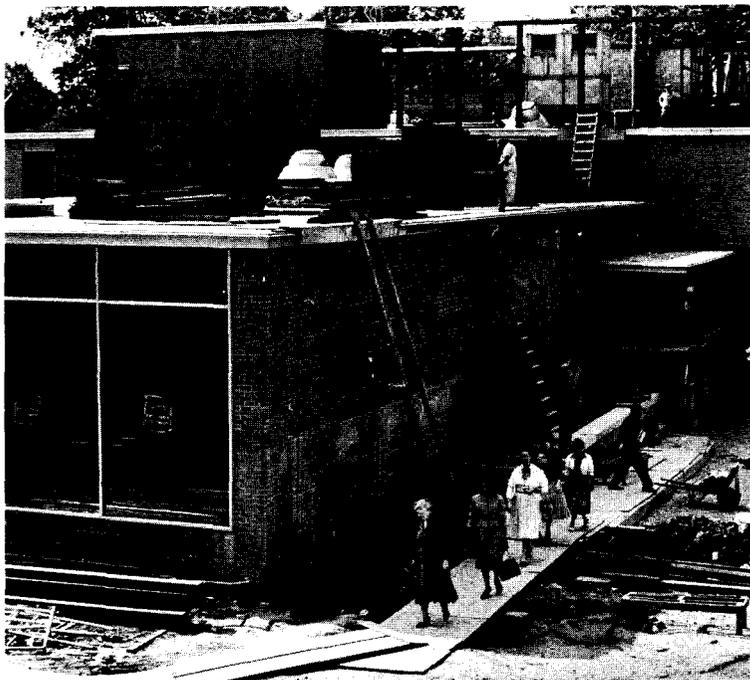
The size of the task can be in part demonstrated by the size of the building—approximately three acres of floor space with a maximum ceiling height of 60 feet in some lab areas.

The original design of both building 7 and 10 took the requirements for low dust level into consideration. Both are served by a special air-conditioning system which is pressurized to "lead" dust particles away from the most critical areas. It removes 99.9 per cent of all airborne dust larger than 5 microns and 99.7 per cent over 1 micron. Janitorial service in 7 and 10 is also keyed to the needs of test and evaluation conditions, and one is never far from a man with a mop in either building.

Even so, vacuum cleaning is a must, and will be done on a regular basis either twice a year, or when spot checks with the Royco Airborne Particle Detector prove it necessary.



Jim Stokes, a native of Lynchburg, S.C., briefs South Carolina Gov. Donald Russell, seated at the right, and his party when they visited Goddard recently. Mr. Stokes, a graduate of the Citadel at Charleston, S.C., presently is technical assistant to Jim Donegan, head of the data operations branch. Occasion for the above picture was a stop in the Mercury computer room for a briefing on the computing system.



How did people "get around" building one three years ago? On boards! Here five Goddard "pioneers" take the high road as workmen look on.

What A Difference 3 Years Makes!

Remember three years ago last Thursday?

You may not, but it was a memorable date for the first handful of Goddard employees who moved to Greenbelt from the Vanguard Computing Center on Pennsylvania Avenue.

They waded in ankle-deep mud, parked in the mud, used Johnnies-on-the-spot, and waited patiently for the water to be hooked up.

Pat Gorman, head of the advanced orbital programming branch, recalled that the first floor of building 1 resembled an "Aztec ruin" as the pioneer Goddard group trampled through dust and over planks to reach their sparkling new computer operation room in the basement.

"It was an exciting time, full of promise and challenge," Mr. Gorman said. "Now there has been an amazing transformation." (True, to the tune of

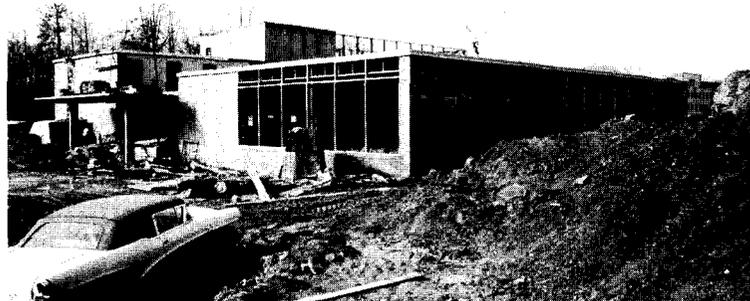
3 thousand employees and a dozen buildings completed or under construction.)

The most vivid recollection for Melba Roy, head of the program production section, were the parking signs which pointed out space in the mud for the Goddard group and hard surface roads for the contractors.

"But we managed to find some space on the roads," Mrs. Roy said.

Parking wasn't the only inconvenience. Those who worked late needed flashlights to find their way over construction materials and those who were used to comfortable dining facilities queued up in front of lunch trailers or ate temporarily from bags.

True, the transformation has been amazing, but, who knows, it may be even more so in the years ahead.



Building 1 looked something like this when the first contingent of Goddard employees began work here in the basement three years ago. Mud, lack of sewer and water facilities, and parking problems marked their debut.

News About Space & Aeronautics

● Scientists too often are getting credit for work done by engineers, according to Dr. Hugh L. Dryden, NASA's deputy administrator.

"There are few groups in our nation whose work is so much taken for granted and so little understood by the public," Dryden said of the engineers, as he addressed the New Jersey Society of Professional Engineers recently.

"Engineers are only too rarely associated in the press with the great accomplishments of recent times," he said. "The development of the atomic bomb, nuclear power plants, and satellites are referred to as scientific achievements in a wholly unjustified perversion of the meaning of the word science.

"The complex jobs required by the nation's space program draw upon almost every branch of science and engineering," Dr. Dryden continued. "In the process, the needs and interests of engineers and scientists are drawing closer together, and the lines of cleavage between the various disciplines are becoming less and less distinct. Engineering has become the full and active partner of science in the exploration of this newest frontier. . . ."

● Relay, NASA's highly successful communications satellite, was used recently to transmit electroencephalograms, "brain waves," from Bristol, England, to Minneapolis, Minn.

The demonstration was conducted by transmitting electroencephalograms from the Burden Neurological Institute in England via land line to the British transmission station at Goonhilly, to Relay and back down to the receiving station at Nutley, N.J., and by land line to Minneapolis. There the signal was fed into a computer which printed out data from which a diagnosis was made. Results were immediately—within one minute—interpreted and sent back to England.

The demonstration was carried out under the supervision of Dr. Reginald G. Bickford of the Mayo Clinic. Dr. Bickford said the process had not previously been tested via satellite.

He said that this test may very well point the way to a more widespread use of this method of processing medical data of many kinds. He indicated that it would be a desirable method of processing data from countries that do not have the facilities available in Britain, the United States, and other technologically advanced countries.

● Three women who have won national recognition in the space age were honored at a luncheon at the Senate on May 9, by Senator Margaret Chase Smith (Me., R.) and James E. Webb, Administrator of the National Aeronautics and Space Administration.

The three women honored were Marcia S. Miner; and Dr. Nancy C. Roman and Eleanor C. Pressly, both of NASA.

Marcia Miner is the 1963 winner of the annual Goddard Memorial Scholarship Award presented by the National Rocket Club to an outstanding student of space sciences. She is a science student at American University where she also teaches freshmen physics.

Dr. Roman and Miss Pressly were winners of the Federal Women's Award in 1962 and 1963, respectively.

Dr. Roman is chief of Astronomy and Solar Physics, in NASA's geophysics and astronomy programs. Miss Pressly is head of vehicles section, sounding rocket branch, spacecraft integration and sounding rocket division at Goddard.

● Requests for aerospace industry proposals for studying manned orbital research laboratory systems capable of sustaining a four-man crew in space for one year have been issued by Langley Research Center.

The results of the comparative studies of manned orbital research laboratory concepts will form another step in NASA research on the most effective ways to permit man to work usefully in space. Extensive research in progress for several years has developed technology applicable to multi-manned orbital spacecraft and has led to continuing interest in the concept. There is no NASA approved flight project for an orbital laboratory at the present time.

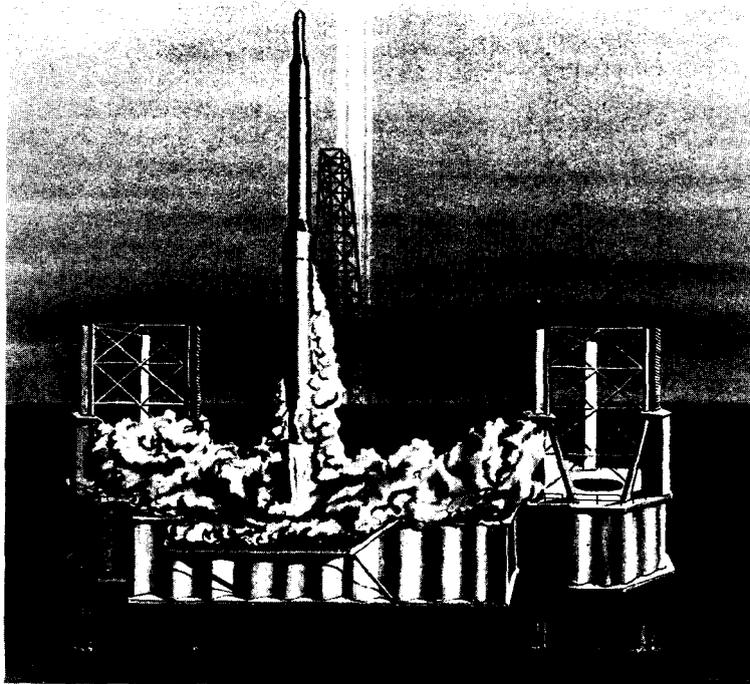
U.S.—Italian Joint Venture to Launch Satellite from “Texas” Tower by 1965

An unusual joint venture in space between the United States and Italy will culminate in the launching of a satellite into equatorial orbit from a towable “Texas” tower in the Indian Ocean off the coast of Africa, probably by 1965. The first San Marco suborbital launch was effected last month from Wallops Island atop a Shotput sounding rocket.

This firing was the first of a three-phase approach to the total problem. A back-up Shotput launch from Wallops later this year will try to correct launch vehicle despin difficulties which occurred on the first launch. Another Shotput launch will be made late this year from the “Texas” tower. Then a Scout orbital payload will be sent up from Wallops.

The third and final phase will consist of placing the complete satellite into equatorial orbit from the tower using Scout. When in orbit, the San Marco satellite will perform high altitude measurements of atmospheric and ionospheric characteristics in the equatorial region, a pioneer venture.

The memorandum of understanding preceding the institution of the project was made between the Italian Space Commission and NASA. It provides for the Italians to design



This artist's conception shows the final phase of the San Marco project, the launch of the satellite from a floatable “Texas” tower using the NASA Scout solid fuel booster.

and construct the satellite and the experiments on board.

Canada's Alouette is the first satellite built completely by a nation other than the United States or the Soviet Union. San Marco will be the second.

NASA will provide the launch vehicles for preliminary tests and for the final launch (see drawing). Another NASA commitment is the training of

Italian launch crews. Goddard test facilities have been available to the Italian team for payload testing. Members of the Italian team have trained here also.

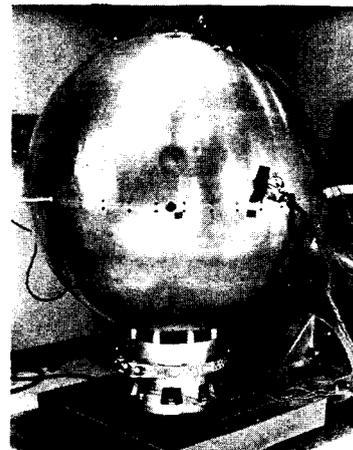
Goddard's project manager is Anthony Caporale of the project management group, who was chosen because of his extensive systems background, and because he is conversant in Italian and has worked closely with the Italian scientists at Goddard. Overall project manager for NASA is R. D. Ginter of the Office of Space Sciences.

Since the beginning of the San Marco project last year, Caporale has noted “a growing feeling of awareness of the scope and complexity of the project” among the members of the team from both nations.

The preparation of the payload for the project is being carried out by Italian university science groups under the Italian commission. The payload will weigh approximately 225 pounds at launch, according to Caporale.

The director of the Italian section of the venture is Professor Luigi Broglio of Aerospace Research Center in Rome, who conceived the project.

Professor Nello Carrara,



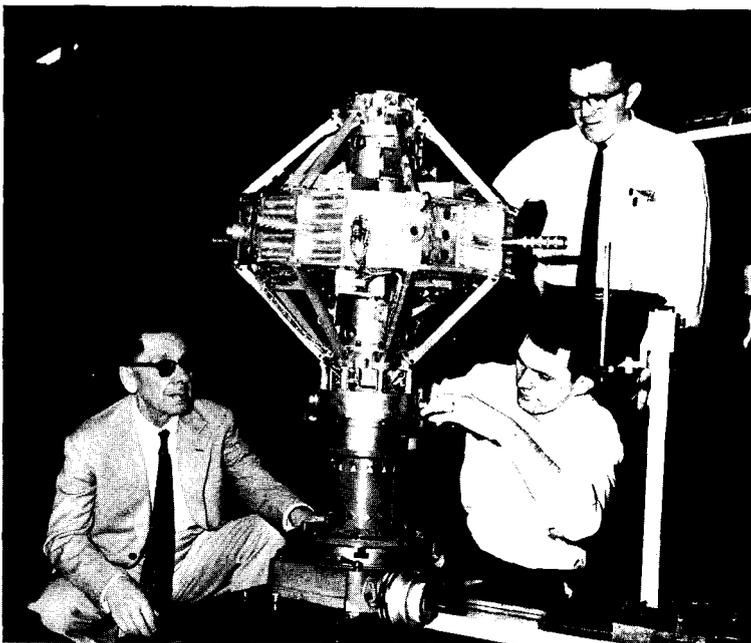
Shown above is the engineering model of the San Marco satellite as it was made ready for vibration testing at Goddard recently.

head of the Italian National Institution of Microwaves in Florence, is responsible for the preparation and construction of the ionospheric experiment and the transmitting antenna of the San Marco payload.

Other Italian scientists who have been working closely with Professor Broglio include Professor Paolo Santini, trajectory computations; Dr. Giorgio Ravello, payload engineering; Dr. Carlo Buongiorno, technical coordination; Dr. Michele Sirinian, vehicle and operations; Dr. Ugo Ponzi, payload structure; Dr. Carlo Arduini, data reduction; Dr. Bruno Ratti, ground stations; Dr. Giuseppe Spampinato, vehicle assembly; Dr. Mario Marconi, structure equipment; Dr. Gennaro Orsi, machinery and power supply; and Dr. Severino Giorgi, trajectories; and Sergio Marino, telemetry.

Members working on the project from Goddard, in addition to Caporale, are: Maurice Handegord, project coordinator; Dick Dettmering, T&E manager; Roger Tetrack, operations manager; Don Premo, tracking and data manager; John Jackson, ionospheric expts.; Nelson Spencer, atmospheric expts.; Don Krueger, systems integration; Milt Schach, thermal; Charles White, mechanical structures; Dave Hepler, receivers, decoders, transmitters; Justin Schaeffert, programmer; John Steckel, antennas; John Callaghan, power supply; Ed Bissell, telemetry.

Goddard's initial effort in the project emanated from the office of the assistant for international programs, headed by Gilbert Ousley.



Here the San Marco prototype payload is being prepared for environmental testing at Goddard by (left to right) Giovanni Tarabra of the Italian Space Committee and Tom Harbach and Dave Streaker, test and evaluation.