

Goddard Rocket and Comet Teams Prepare for Eclipse

A special series of sounding rocket firings to probe the ionosphere during Saturday's solar eclipse will be made from Canada's Churchill Research Range, White Sands and Wallops Station.

At Fort Churchill, 6 Nike-Apachees, an Aerobee 150 and a Canadian Black Brant rocket will highlight the 2-hour 12-minute eclipse period. The Nike-Apachees are being directed by the Geophysics Corporation of America under a Goddard contract. The Black Brant is instrumented by the Cambridge air force research lab.

The short period of changing solar radiation intensity during the eclipse offers a unique opportunity for rocket measurements. The results are expected to provide a new insight into the precise effects of solar radiation on molecular particles and the temperature in the upper regions.

Eleanor Pressly, head of the vehicles section of Goddard's sounding rocket branch, said that this is the "first time since we have been doing research using rockets that an eclipse has occurred so near an established firing range."

The firing of the Aerobee rocket will initiate a new Aerobee program made possible by recent rehabilitation of the range, Miss Pressly added.

The Johns Hopkins University, working under a Goddard contract, will have instrumentation on board two of the Aero-bees to measure the ultra-violet emission and distribution of molecular and atomic particles in the upper atmosphere. Dr. W. G. Fastie of Johns Hopkins is the project scientist.

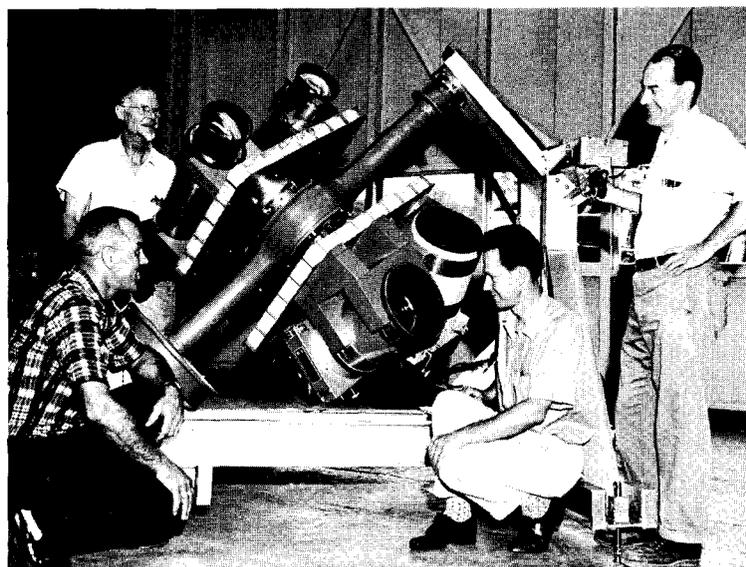
Goddard will provide 4 of the launchers which, along with an equal number presently at the range, will accommodate the 8 launchings during the eclipse period.

At White Sands, an Aerobee 150 will have 3 experiments aboard. They will consist of a coronagraph to photograph the sun's corona, an ultraviolet spectrophotometer aimed at the sun's center, and a camera to take pictures of the whole sun's

(Cont'd on page 8, col 3)



Dr. Leslie C. Smith of the Geophysics Corporation of America is shown with casings of Nike-Apachee sounding rockets due to be fired under his supervision from Fort Churchill, Manitoba, during the solar eclipse Saturday. He holds solar radiation sensory instruments in the position they will occupy after rocket ejectable doors have been triggered at approximately 150,000 feet during ascent into the ionosphere.



Luc Secretan and Dr. Bertram Donn, standing, and Harry Burton and Dr. Francois Dossin, kneeling, look pleased with their homemade photo apparatus they designed to record Saturday's eclipse.

A six-man Goddard team is preparing for Saturday's total eclipse of the sun from a vantage point in the heart of the moon's shadow.

Setting up photographic instruments on a remote hillside site at Pleasant Pond, Me., are Dr. Francois Dossin of Belgium, working at Goddard under a NAS fellowship, Dr. Bertram Donn, Curtis McCracken, Luc Secretan, Otto Berg and Harry Burton. All are from Goddard's astrochemistry section in the astrophysics branch.

The eclipse, a geometrical freak in that the moon, will be just the right size and at just the right distance to cover the sun, will not cover the sun's upper atmosphere or corona. The result: not only the corona itself but other phenomena near the sun, such as comets, will become visible in the darkness created by the moon's shadow. Such objects near the sun can only be seen during an eclipse.

"This is the first systematic search to locate comets during an eclipse," said Dr. Donn. "Even when comets have been visible during other eclipses, not much attention has been paid to them."

The most recent discovery of comets during an eclipse occurred in 1948 in southern Africa.

Dr. Donn said the only other method of observing comets near the sun would be by an orbiting astronaut who would be free of the earth's atmosphere and able to observe close to the sun at any time, not just the short span of a few minutes that is available on the ground during the totality of an eclipse.

The expedition was suggested by Dr. Dossin, who designed the mechanism. It was built by Goddard's fabrication division. On a shoe-string budget Dr. Dossin purchased surplus aerial survey cameras and an old truck rear axle. The axle is used as part of the camera mounting system, so that the platforms can be oriented to face any part of the sky and follow the sun during the eclipse.

The mechanism has a total of 9 cameras, 2 of which are

(Cont'd on page 8, col 3)

Goddard's Mail Room Resembles City Post Office

Goddard's mail room function can be compared to the job of the post office in a small city. In fact, other specialized duties complicate the job even more—for example the shuttle operation for the NASA airlift from Goddard and NASA headquarters to Wallops Island and Langley Research Center in Virginia.

An inventory of only internal mail showed that the mail room, under the supervision of Durrell Moore, handles an average of 2.5 million pieces of mail per year.

In addition to incoming and outgoing U. S. mail, the "Goddard post office" takes care of internal mail, interbuilding delivery service, and special messenger service.

As all mail comes in, from external and internal sources, it is broken down by code to branch level, then distributed on two daily mail runs. The entire center receives this service, along with the outlying sections (Jackson street, Lawrence street, College Park, Beltsville, and the University building in Adelphi, Md.) There are also scheduled runs to NASA headquarters in Washington.

The NASA airlift operated through Goddard is based at National Airport, using Butler Aviation facilities there. There are two incoming and two outgoing flights per day between the Washington area and the

Virginia NASA facilities; thus the Goddard shuttle makes four trips per day to the air terminal. The shuttle and airlift carry mail and passengers as well as some freight.

Meanwhile, back at the center, two daily mail drops are made to approximately 130 different points, between 40 and 50 separate distribution lists are serviced (ranging from policy and procedure directives to the biweekly distribution of the GODDARD NEWS).

Moore's mail room staff is also responsible for making and distributing desk name plates

and door signs, which are produced in house on the Embosso-gram machine. A supply of Goddard, NASA and standard government forms are stocked by the mail room for distribution to interested persons on request.

When you pick up the phone and call for any reason, a soft Southern accent usually greets you — "mail room, Ednuh." From that moment until your request is granted, this service department continues its myriad duties as unsung servant of the center. The mail must go through, and it does.



Durrell D. Moore, mail room supervisor, is Goddard's postmaster. Here he receives another call.



Shown here sorting mail after the morning delivery are (from left): James Dillingham, Graper Sauls, Bernard Duellley, William Dillon, Jack Campbell, Luther Tate, James McKinney, John Jones, and Wade Willis in the foreground.

Goddard Speech and Paper Presentations

(Technical presentations approved as of July 9 for period of July 15 through July 28. Requests for copies of speeches and papers should be made directly to the author.)

SPEECHES

Dr. John O'Keefe, Summer Seminar in Space Mathematics, American Mathematical Society, Ithaca, N.Y., July 1-Aug. 9, "*The Earth-Moon System in the Light of Recent Discoveries in Space Science*"; Summer Institute in Astronomy and Space Sciences, Philadelphia, July 15, "*The Earth and its Motions*."

H. I. Butler, Cornell University, Ithaca, N.Y., July 17, "*The Meteorological Satellite Program*."

D. E. Guss, Secondary School Teachers' Institute, Buckhannon, W. Va., July 19, "*Particles in Space*."

William Kaula, Cambridge Summer School on "*Dynamics of Rockets and Satellites*," Cambridge, England, July 19-22, "*Gravitational and Other Perturbations of a Satellite Orbit*."

Dr. Su-Shu Huang, National Science Foundation Summer Institute in Astronomy and the Space Sciences, Philadelphia, July 25, "*The Origin of the Solar System and Life in other Worlds*."

A. Temkin, Third International Conference on the Physics and Electronics of Atomic Collisions, London, July 22-26, "*The Structure of Electron Hydrogen Resonances Just Below The Inelastic Threshold*."

Dr. K. Omidvar, Third International Conference on the Physics and Electronics and Atomic Collisions, London, July 22-26, "*2s, 2p, Electron Impact Excitation of Atomic Hydrogen*."



Harry Itkin, a summer employee, discusses a problem with "the voice of the mail room," Edna Mae Weller. Edna's voice is familiar to almost everyone at Goddard who has called the mail room.

Employee Gets Degree After 12 Years in Night School

A 12-year stint of combining night school classes with a full-time job has paid off for a Goddard engineer.

The reward came last week to Carroll Horn of the flight data systems branch in the form of a new job title—electronics engineer.

The occasion marked his graduation from George Washington University with a bachelor's degree in electrical engineering.

Mr. Horn, who has been an electronics technician since starting at NRL in 1950, began the long road to a college degree at night school the same year. He interrupted it only once—for a year in the early 50's to take a part-time job to enable him to marry.

During the 13-year span over which his education was spread, Mr. Horn compiled more than 140 semester credits (equivalent to a 5-year degree) accumulated from classes he attended up to 6 hours a night for as many as 5 nights a week. He



CARROLL HORN: *The end of a journey*

enrolled in as many as 3 courses a semester and on occasion added a fourth.

Mr. Horn said there are several disadvantages in stretching out a college education this way. One results when curriculums are revised and prerequisites changed so that future course programs don't follow in a planned sequence. Another occurs when a person must divide his efforts between school and work rather than

concentrating entirely on one.

"It is a definite advantage going to college full-time," said Mr. Horn. "But if you can't, it's still worth going, even the hard way."

Dr. Robert Rochelle, branch head, pointed out that individuals who better themselves in such a way are a definite asset to the Center.

"An individual who is working can relate what he learns in school to his job," said Dr.

Rochelle. He said that in the process a person up-grades himself to a professional level which enables him to advance further than he could without a degree.

"And getting a Bachelor's while working full-time is a lot tougher than going for a graduate degree."

Mr. Horn gives plenty of credit for his success story to his wife Betty for her patience, encouragement—and typing help.

"I am just beginning to lose the nagging feeling that I should be studying instead of working around our new home or watching TV. Betty, of course, is very happy to be getting more help."

Born in Kentucky and raised in Pennsylvania, Mr. Horn has lived recently in Arlington where he graduated from high school. He is an army air force veteran of World War II during which radar and electronics training aroused his interest in engineering.

Goddard Engineer Combines Interest in Science, Music

Victor R. Simas personifies the new breed of engineer helping to push America to the top in the Space Age.

In appearance and manner this slightly balding engineer is affable, even jocular, yet a man of considerable personal and intellectual force who is a perfectionist in whatever he handles.

As head of Goddard's RF systems branch in the tracking systems division, Vic conveys unusual enthusiasm for a variety of interests, but this is overshadowed by a continuing dedication to his first love, space science.

Vic's interest in space activities was aroused while still in grammar school, at a time when space activities were relatively unheard of. "I envisioned myself in a space suit entering the doorway of a capsule on the way to the moon," recalled Vic of his childhood dreams.

Today Vic's concern is more "down to earth" but nevertheless quite related to his earlier aspirations. Evidence of this is his latest Goddard publication, a detailed proposal—which is under consideration—for the electronics systems in the ground stations that will guide

the Apollo moon craft back to earth. Vic's contribution is titled "A System for Re-Entry Tracking of the Apollo Spacecraft," published April 2.

Vic finds diversion in music and a variety of sports. Besides being an avid listener, Vic, who believes scientific people are especially musically inclined, plays several musical instruments with somewhat greater skill than he admits. "I can't read music well but I make up for it with lousy tone."

Vic's sporting activities span land, sea and air. Currently completing the requirements for his private pilot's license, Vic

fishes, hunts, golfs, skis, bowls, plays bridge, "and sleeps—sometimes." You can also find him swinging a bat for the tracking systems division team in the Goddard softball league.

As always, however, his primary concern is with projects in the RF systems branch, where his creativity and inventiveness are exploited in the design and development of complex tracking and telemetry systems and components. As a result of his ability to "get the job done" he has been named as interim technical director of the Alaska data acquisition facility, responsible for putting

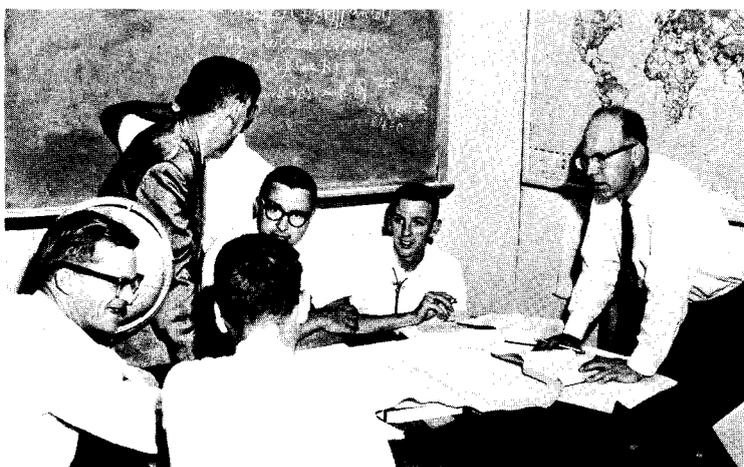
this 85-foot dish station into full operation.

In addition, he is working on a unified graphical and mathematical analysis of phase demodulation, a subject not adequately treated in existing literature, as well as an authoritative treatment of "Spacecraft Tracking" for the AGARD/NATO organization.

These projects along with the many other aspects of running a 23-man research and development branch provide limited time for outside interests.

Vic is a native of Reno, Nevada, served in the navy in World War II, and graduated from George Washington University with a bachelor's degree in electrical engineering, whizzing through the 4-year course in 3 years.

His first recognition in space activities came in 1958 as the result of his contributions as Blossom Point Minitrack station director. During this assignment, Vic pioneered developments in the tracking and data acquisition program for the first U.S. satellite, Explorer I, and for later Vanguard satellites. As Vic modestly puts it, "during the Vanguard days, I rose from oblivion to mere obscurity."



Vic Simas, right, at work with branch personnel.

Wallops Station Has Only

Last year, Goddard's sounding rocket branch was responsible for the launching of 78 sounding rockets. All but 19 were sent aloft from Wallops Station, the only launch site completely owned and operated by NASA, and under civilian control. More than 5,000 research vehicles have been launched there since 1945.

Goddard provides support for all NASA sounding rockets, providing vehicles and technical liaison with the various experimenters. Wallops Station's specific mission is to handle the hardware involved in a launch, get the experiment to the necessary position and velocity in space, track it, and acquire and record the data required by the experimenter.

The installation is located on the site of the former Chincoteague Naval Air Station on the Eastern shore of Virginia. In addition to sounding rockets, Wallops also works with small meteorological rockets, and with other vehicles up to the size of the solid-fuel Scout, which has orbital capability. Approximately 300 experiments of all kinds are sent aloft each year.

In fact, three satellites have been inserted into orbit from Wallops—Explorer IX, Explorer XIII, and Explorer XVI. The second U. S. - U. K. international satellite, the U.K. 2, is scheduled to be launched from Wallops later this year.

During all firings of Goddard rockets from the launch site, Loyd Lohr of this center's vehicle section is in the control center. He is assigned to Wallops on a full-time basis as liaison man, coordinating the preparation and firing of vehicles managed by Goddard. The sounding rocket branch also maintains telemetry stations and Dovap tracking systems at Wallops.

Experiments used on the Wallops-launched Goddard sounding

Editor's Note: This is the sixth in a series of special articles on the activities and responsibilities of NASA's far-flung installations and operations.

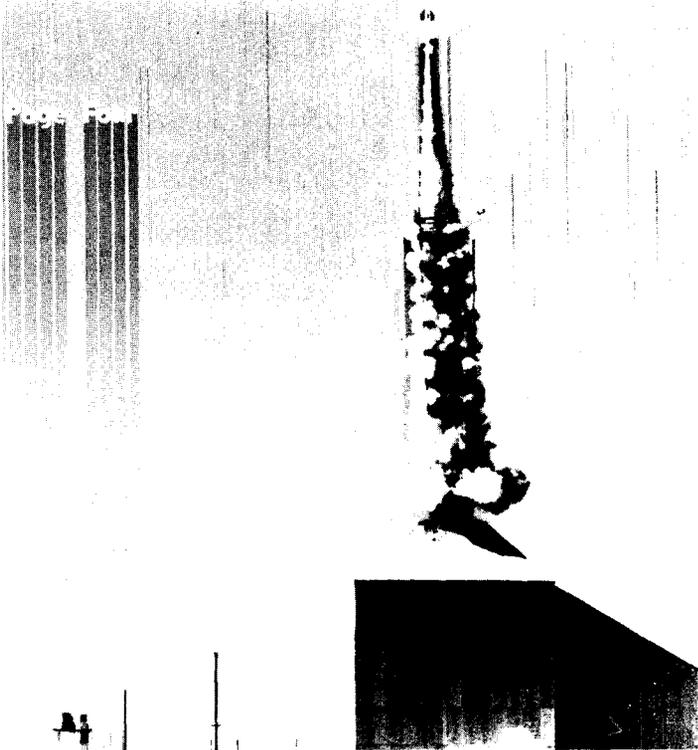


Robert L. Krieger
Director

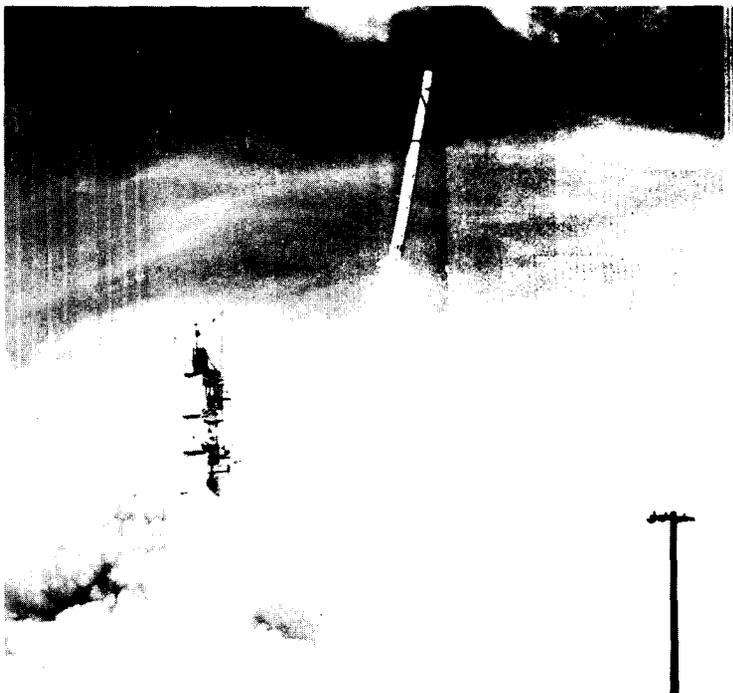


This overall view of the Wallops for sounding rockets. The Aero

Italian scientists examine the second and the Italian San Marco pro firing, a sub-orbital launch.

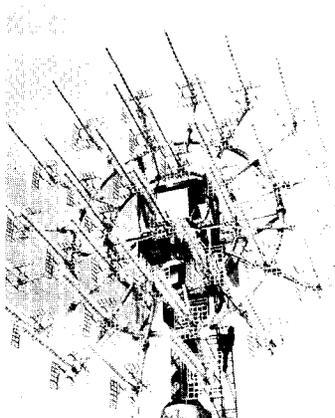


Here an Aerobee lifts off from Wallops Island. It is the only liquid fuel vehicle launched at the station, and is used for a variety of experiments, truly a NASA workhorse.



Scout, shown here, is the largest booster used at Wallops. All three satellites launched from the station used this vehicle, which is 72 feet high. Scout uses solid fuel.

This high-gain receiving antenna is used to receive electronic information.



At the console in the foreground, the test director and his assistants prepare for a firing. This is a view of the range control center. Remote-controlled plotboards are in rear.



T&E Plays First Golf Tournament

The Mike Jackvonny Memorial Golf Tournament proved to be of great interest to the 32 players from test and evaluation division who participated.

Mike, who was with T&E prior to a recent fatal automobile accident, originally organized the tournament. Chet Smiley (a contractor with Consultants and Designers) carried on with Mike's plans for the golf tourney.

Two Flights

The tournament was divided into two flights. The winner of the first round would go into the championship flight and the loser would go into the consolation flight, giving each a chance to play two rounds. The matches were played at either Belair, Glenn Dale or the University of Maryland course.

John C. New, chief, test and evaluation division presented the trophies to the four top winners.

Russ Dorrell was the winner of the championship flight. Russ turned in his winning card of 73, only one over par. Runner-up was Bill Kitts, with an 86.



INSIDE GODDARD

GODDARD SPACE FLIGHT CENTER / GREENBELT MARYLAND

July 15, 1963

The consolation winner was Jocko Stitt, with an 82 over runner-up Bob Vandevisser's 126.

One Woman Competes

There was only one woman to enter the tournament and she deserves mention — Myrtle Quarles. Myrtle was real competition for the men. Ending in the semifinals of the consolation flight she shot an 81½, the Callaway system, to her opponent Bob Vandevisser's 78.

First Round Awards

Special awards of one golf ball for the first round of play were presented to: Harry Norris, low gross; Russ Dorrell, 2nd low gross; Morris Falk, low net; Albert Timmins, 2nd low net; Chet Smiley, most pars; Walter Owens, 2nd most pars; Gerald Youse, George Newlon, Jocko Stitt and James Sundermann for the most birdies.



Tournament winners are (from left): Russ Dorrell and Bill Kitts for the championship flight and Jocko Stitt and Bob Vandevisser for the consolation flight.

Pirates Receive Space Cup Trophy

The big win by Peake's Pirates over Bourdeau's Tigers in a slow-pitch softball game was commemorated recently when Dr. Goett unveiled the Space Cup Trophy which symbolizes the event and presented it to the winners. There it stood—the baseball atop a bat with fins cleverly designed to look like a rocket. Jack Peake accepted the trophy on behalf of his team and complimented the Tigers for their imaginative trophy.

Jack's group did not want the

Tigers to go away empty handed so an empty box inscribed "For the team who has nothing and now, something to keep it in."

The series is all tied up 1-1. What will the next event be? Since Bourdeau's Tigers were the losers it is their choice to specify the next event. Say the Tigers: "Because of the inherent athletic ability of the planetary ionospheres branch, the choice of the next contest is not expected to be a problem."

Employees Actively Repeat Puns, We Relay Swiftly

"Tiros takes great pictures," he said candidly.

"Put it in the solar chamber," he directed radiantly.

"Does Tiros measure reflected sunlight?" she asked brightly. "Yes, and the earth's infrared emission too," he answered radiantly.

"But I'm talking about the peaceful uses of space," he said disarmingly.

"Why not make it synchronous?," he inserted orbitally.

"That's where the job belongs," directed the classifier categorically.

"Oh, I love my gift," she said raptly.

"So we're falling a little behind," he said pertly.

"I insist Rosman track it, don't you?," he interrogated commandingly.

"The Echo inflation test was successful," he bellowed expansively.

"Now try for 10⁻⁹ torr," he gasped vacuuously.

"Bring me the liquid nitrogen," he hissed icily.



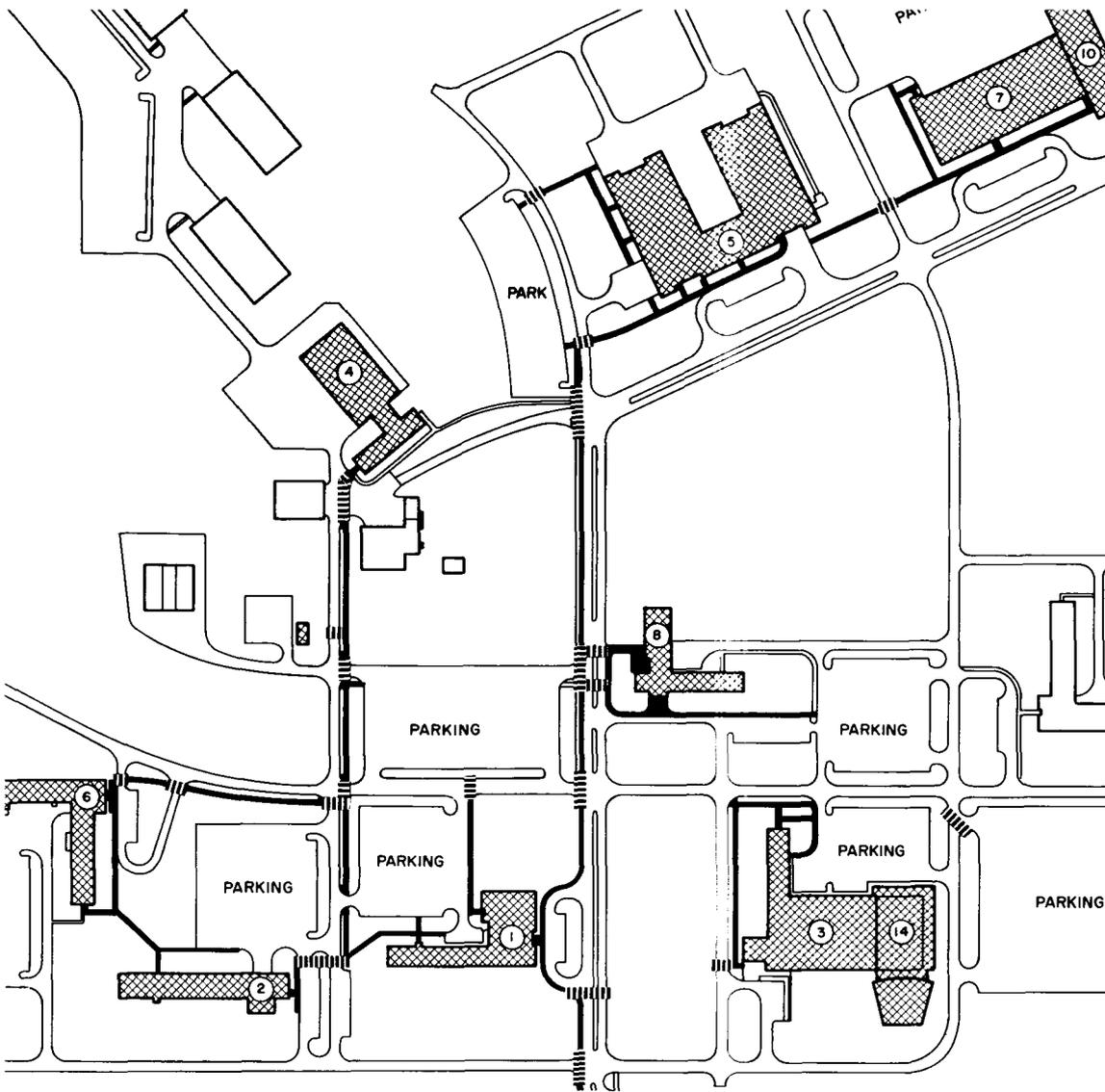
Dr. Goett presents trophy to Jack Peake.



Bob Bourdeau accepts humorous gift from Jack.



Peake's Pirates are shown from left: Norman Goldman, Vincent Brown, David Hepler, Robert Snyder, Stanley Fawley, Joan Widmayer, Charles Rice, John Steckel, Harry Moore, William Tallant, Ron Adkins and Jack Peake.



Magical Names Abound at Goddard

There's magic in a name, and here at Goddard we have more than 3,000 to work with. Did you know that Bobbie Kennedy is working here for the summer? (Roberta, of course!) And perhaps the nicest guy in NASA—Gary Kindness—works here too.

We're fortunate enough to have a Caruso, and a gentleman named Hightower (he works with antennas). There is a Colony in thermal systems, and a Constable in data acquisition.

Goddard can also claim a Crowder, a Croucher, and a Crabtree.

Dasher, Dangle and two Darlings work here, not to mention a Deacon and a Dean. A Dove and a Duck, a Fang and a Fern are at Goddard. We also claim a Whale, a Woodhouse, and a Woodyard. We have some Hunters and a Huntress as well. A Lake, a Lane, a Leach, and a Lurch are here—along with a Church.

Love is at work at the center, and there are two Parks here, along with a Rose, a Moss and a Stone. A Peacock and a Wren both know there's a Quill here

We have a Pick and Plum, a Rice and a Snow, a Small and a Smart. Goddard can also claim a Sargent and a Singer, three Stranges and a Streaker, somewhere.

There's a Steel and a Weld and a Sparks at Goddard. We'll really have action if they get together. Shockey and Bangs work in vibration testing.



■■■■■ CROSSWALK

Don't Squawk If You Jay Walk

Why print this in INSIDE GODDARD? It's for your protection—pedestrians and vehicle operators. A crosswalk, jokingly called a mad sidewalk, is a very important safety aid. It has been noted that the crosswalks are not being observed. The

above chart indicates where all these walkways are located throughout the center. For their own protection all pedestrians should cross only at these points and all vehicle operators should observe the pedestrians right of way.

Frum 'Lil-Asternerts

James gets around:

Dear Sirs;
 I am interested in space. I am writing to you because James Holloway told me to. He's my friend. I was wondering if you could send me the same that you sent James.
 Thank You Michael
 Please send me some information on rockets?
 William
 P.S. My coin told me about it. Its name is James Holloway Jr.

All-NASA Launch Facilities

rockets come from a variety of sources including Goddard, other centers, the world-wide scientific community, other government agencies, colleges and universities and private industry.

Early this month an unusual experiment was sent aloft from Wallops. A probe was sent into the orbital path of the Canadian-U.S. Alouette satellite almost 600 miles above Wallops in an effort to measure the same conditions at approximately the same time with two devices. The sounding rocket probe made its measurements in the upper ionosphere within two minutes of soundings taken by the international satellite.

Measurements of ion and electron temperatures and densities obtained by the sounding rocket payload are now being compared with similar data transmitted almost simultaneously by Alouette on its pass over Wallops. This is only one example of the interesting and intricate work of Wallops.

Robert L. Krieger was appointed Chief of the Wallops Station in 1959. His title was changed to Director in 1960. Krieger has been associated with NASA and its predecessor, NACA, since 1936.

Wallops is not a new installation. A launch site was established there in 1945 by Langley Research Center while that center was still under the National Advisory Committee for Aeronautics. It was then designated the Pilotless Aircraft Research Station, and assigned the mission of supplementing wind tunnel and laboratory experiments.

When NASA was formed in 1958 and absorbed NACA facilities, the Pilotless Aircraft Research Station became Wallops Station—a separate entity which operates directly under NASA headquarters in Washington.

News About Space & Aeronautics

● Contracts to study rockets having first stages of chemical propulsion and upper stages of nuclear propulsion have been awarded by NASA to Douglas Aircraft Co. and General Dynamics-Astronautics. The combination vehicles will have the ability to lift 1 million pounds into orbit.

The two firms are to do independent research, and arrive at attractive chemical-nuclear rocket configurations. They have been asked to develop criteria for comparing the several concepts, and to single out problem areas requiring more detailed investigation.

• • •

● “There are reformist politicians who would never agree with the conservatives on anything else whatever—who don’t want this money (for space explorations) spent simply because in their opinion not enough is being done for projects like ‘urban renewal’. Such men no doubt would have screechingly stopped development of the airplane a lifetime ago if, in the meantime, the street cars in New York were in any way inadequate and the slums in Chicago or Philadelphia had not been totally replaced by public housing.”—*Washington Evening Star*

• • •

● The deployment of NASA’s recoverable micrometeoroid probe paraglider on May 14 was not accomplished as reported in the June 17 GODDARD NEWS. The paraglider, contained in a canister carried inside a cylindrical extension of the Aerobee 150 rocket, did not inflate because the canister failed to come out of the housing.

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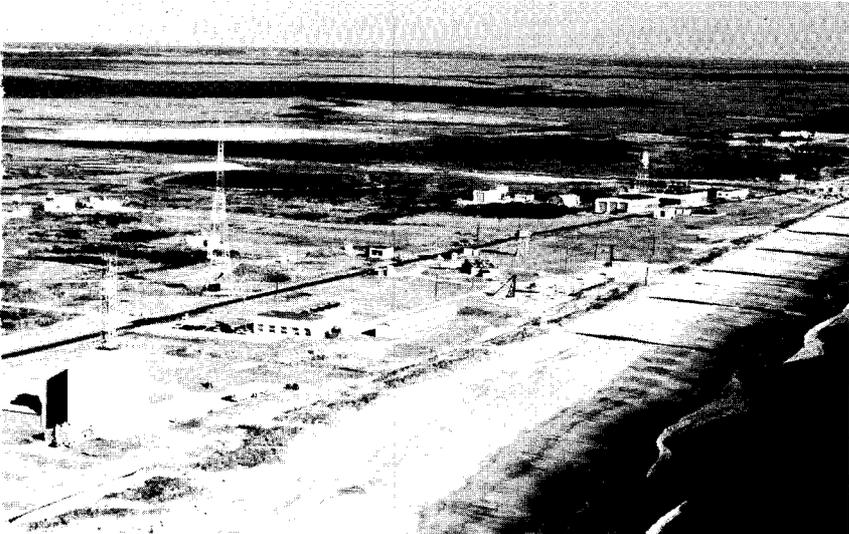
● A modified Boeing Stratocruiser, the B-377PG (Pregnant Guppy), airlifted the largest cargo ever transported by airplane last month from Los Angeles to Edwards AFB, Calif., beginning loaded flight tests for the Federal Aviation Agency and NASA.

The Guppy’s cargo, was an inert S-IV stage of the Saturn I vehicle. The cargo, including its ground transporter, weighed 20,379 pounds. It is manufactured by the Douglas Aircraft Co. The inert S-IV simulates weight and cube of a live Saturn stage.

When certification by the FAA is accomplished and results compiled on compatibility of the Guppy, and the S-IV, the modified Stratocruiser will be used to carry flight stages to the Cape Canaveral launch site.

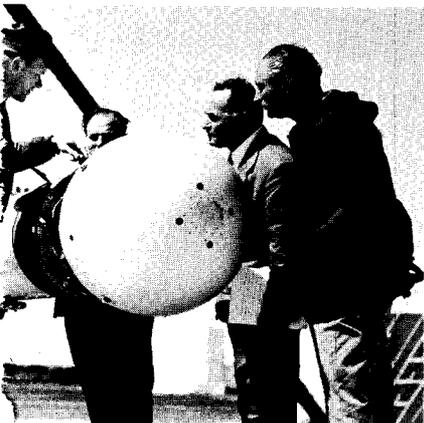


Guppy flights are expected to cut S-IV transportation time from three weeks required for barging through the Panama Canal to about 12 hours of flying time.

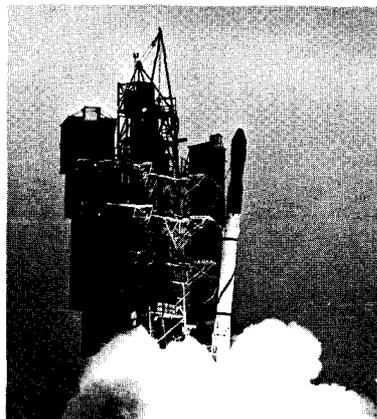


Island main launch area shows some of the launch sites used. See launch building is in the left foreground.

End stage of a Shotput booster project payload prior to a test



Here is the Scout booster that placed Explorer XVI into orbit late last year.



YOUNG SCIENTISTS SPENDING SUMMER AT GODDARD



Mrs. Margaret Maury, American University coordinator (left) looks on as summer students (from left): Alan Hillerson, George Williams, Barry Springer (pointing), David Cook, Henry Masur, David Chang, and Tom Silliman observe model of magnetic fields facility. William Medina, Goddard's program coordinator from the employee development branch, is at right.

Seven area high school students with a high degree of scientific interest and aptitude are spending their summer "vacations" working along side Goddard scientists and engineers. They are participants in a unique cooperative program devised by the Washington area scientific community.

Goddard is one of several local research and development agencies and organizations taking part in the Summer Science Research Program. It is co-sponsored by the American University and the Joint Board on Science Education, a 12-member non-profit scientific and educational organization. A National Science Foundation grant partially supports the program.

Four of the students are assigned to Goddard's Summer Workshop: George W. Williams of Wheaton high school, David B. Cook of Walt Whitman high school, Thomas B. Silliman of Bullis Prep and David Chang of Middlesex Prep. This phase is directed by Dr. Elias Klein.

Each of these students are assigned to a specific study project, and joins several academic personnel and Goddard technical people in an investiga-

tion of the project. Williams is doing work on solar radiation and simulation, Cook on heat transfer and vacuum technology, Silliman on magnetic environment simulation and Chang on causes and effects of radiation damage.

Allen Hillerson of High Point high school is assigned to the optical test group in the engineering design branch of the test and evaluation division. Equipment is being set up now for optical work on the Smithsonian Astronomical Observatory (SAO). Hillerson will be involved in this project.

Henry Masur of Sidewell Friends school is assigned to the RF systems branch of the tracking systems division. He is being given a general introduction to transistors, electrical systems, and tracking problems. His current assignment is in checking the collimation transmitters which will be used to set the 80-foot tracking dishes.

Barry Springer of High Point high school is also assigned to the RF systems branch. His project is running performance tests on coaxial hybrid networks at -40° centigrade and $+150^{\circ}$ centigrade. The tests will check coaxial power switch-

es and construction of wide-band transistorized amplifiers as well as other factors.

A Growing Program

In 1962, there were 48 students in the entire program, with only two assigned to Goddard. This year, Goddard's seven participants are among 83.

Last year, according to Bill Medina of the employee development branch, the two students wrote glowing reports of their experiences here. Medina, who is coordinating the program, said that both youths recommended that the opportunity be continued and extended.

This year, as in the past, students were required to submit their grades in science courses and to write two essays: one on why they would like to participate in the program and a second on their past interests and achievements in the general fields of science and technology. A written recommendation from a teacher and permission from their parents was also required.

The 83 participating youths have been selected after requirements were reviewed by the co-sponsors. The first two

days of the 8½-week program were spent at the American University for orientation lectures before assignment to research facilities. American University coordinator for the program is Mrs. Margaret H. Maury. The last two days of the sequence will also be spent at A.U., this time for student conducted seminars.

Motivation is High

What motivates high school students to spend a summer submerged in technical work for no pay other than a small stipend (\$85 for the entire summer) which hardly covers carfare and lunches? Some of the answers came to the surface in the student application essays, and some in a review of other factors.

For example, Barry Springer wrote, "... I believe an opportunity to participate in research in this field would prove of invaluable aid in pursuing my chosen profession." (He plans to become an electronics engineer.)

"This truly would offer scientific knowledge in significant depth," commented George Williams.

"When my physics proctor
(Cont'd on page 7, col 1)

(SCIENTISTS, from page 6) informed me of your summer program, he said it would provide excellent experience to anyone participating. I agree with him completely," said Thomas Silliman.

David Chang wanted to participate in the program to use and develop what he had learned, and to increase his knowledge. "The top scientist of the future will be he whose knowledge is not restricted to just one narrow field," he believes.

Henry Masur spent eight Saturdays last fall attending a non-credit course in science

writing given to selected high school students at Georgetown University.

Alan Hillerson pointed out, "I have held an interest in science since I was a child . . . for the past three years I have been a member of the Washington Junior Academy of Sciences."

Now, for the summer, Goddard is working with these highly motivated and enthusiastic scientists of tomorrow. The experience promises to be of great benefit, both to the students, to Goddard, and the nation's investment in strengthening its intellectual resources.

NASA To Negotiate With Republic Aviation on Phase I of AOSO

NASA has selected Republic Aviation Corp. of Farmingdale, N. Y., for negotiation of a contract for phase I development of the Advanced Orbiting Solar Observatory (AOSO), a Goddard project. Project scientist is Dr. John C. Lindsay and project manager is Adolph J. Cervenka.

Phase I, which will require about one year, will include detail design, systems engineering, reliability assessment, limited hardware development of critical systems and components and trade-off analysis. The contract is estimated at approximately \$5½ million.

A breadboard model of the control and data handling systems and development of an engineering model of the sun sensor are included in the contract.

A 300-nautical-mile polar orbit is planned for AOSO, above the obscuring and distorting influences of the earth's atmosphere. It will make observations in the X-ray, gamma ray, ultraviolet, infrared and visible region of electromagnetic spectrum.

These observations should lead to a more complete understanding of the structure, dynamics and composition of the sun and its effects on the en-

vironment of the earth, other planets, the moon, interplanetary space and manned space flight.

AOSO will differ from the current solar observatories in that it will have greatly increased pointing accuracies, control flexibility, data handling capacity and experiment instrumentation.

The most significant of these is the increased pointing accuracy which will actually permit observations of a single sunspot on the sun's surface. Under present conditions only gross observations over a large area of the sun are possible.



This model of the proposed Washington Planetarium and Space Center has attracted a great deal of attention while on display in the lobby of building 1. Bill Watson, public affairs office, and Marie Matthews, receptionist in building 1, are discussing features of the scale model. It is scheduled for construction in 1964, and will be the world's largest.

Antenna Contractor Selected For Rosman Tracking Site

Selection of the Blaw-Knox Company, Pittsburgh, Pa., for contract negotiations to supply the antenna structure for the second 85-foot satellite tracking facility at Rosman, N. C., has been announced.

The procurement, estimated at \$590,000, calls for the design, fabrication, and erection of the huge 85-foot parabolic structure to be located approximately one-quarter mile from the first such structure at Rosman.

Known as Rosman No. 2, the antenna installation will function in conjunction with Rosman No. 1 space data acquisition facility in the collection of scientific data to be gathered principally from the more complex family of "second generation" scientific spacecraft.

When completed in late 1964, Rosman No. 2 will join NASA's growing family of 85-foot antenna installations. An 85-foot space data acquisition facility at Fairbanks, Alaska, is already completed and operational. Rosman No. 1 is scheduled for op-

erational duty late this summer. A third big dish installation designed for a Far East location, yet to be announced, will follow at a later date.

When completed, the large-dish will acquire information from, transmit commands to, and track spacecraft such as the Orbiting Geophysical Observatory, Orbiting Astronomical Observatory and the Orbiting Solar Observatory.

Blaw-Knox will provide complete antenna hardware with the exception of the structure's drive motors which will be a separate procurement. "State-of-the-art" design changes will be incorporated for the attainment of maximum mechanical precision in the main support pedestal, rotational axes, and other critical structural elements.

The Pittsburgh organization competed with three other firms and was selected on the basis of a sound technical proposal and competitive pricing structure.

GODDARD NEWS

GODDARD SPACE FLIGHT CENTER / GREENBELT, MARYLAND

"It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow."

—DR. ROBERT H. GODDARD

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Wesley Dibbern, editor—Bruce Brough, assistant editor
Shirley Deremer, Inside Goddard

Phone—Ext. 4141 or 4142



Dr. Raymond Bisplinghoff, director of NASA's office of advanced research and technology, presents a \$200 award to Dr. Raymond H. Wilson, Jr., for his invention titled, "Method and Apparatus for Magnetic Steering," patented while employed at Goddard. At the left is Dr. Kurtzweg and at the right Mr. Littell.

New Rocket Device Is Chosen

A device being manufactured under a Goddard contract with Rocket Research Corporation recently won *Missiles and Rockets'* annual "New Product of the Year" award for 1962.

The subliming solid thruster was picked from 52 new products of the week which were selected by the magazine throughout the year.

Dr. Joseph Fedor, research associate in the mechanical systems branch, who was the first to foresee the values of the new system, said it is "a major innovation" in the field of low thrust propulsion devices for attitude control in spacecraft.

The new microrocket can be used to provide directional orientation of a satellite and make vernier corrections. It has the potential of completely replacing cold-nitrogen-gas systems for vehicle and spacecraft orientation systems where the total impulse required is low or moderate.

Dr. Fedor said it would drastically reduce problems which constantly perplex cold gas systems, such as leaks, pressure regulations, and dangerous high pressure.

"The subliming solid thrusters offer promise of reducing the weight of cold gas orientation systems by 50 per cent," he estimated. In addition, they offer a significant increase in specific impulse over cold gas systems (which most present satellites employ), and provide

a fuel with an extremely long shelf life and low power consumption. It also does away with dangerous high pressure gas tanks.

The new rocket is designed to provide thrust levels from 0.0001 to 10 pounds and it employs a new type solid propellant, thus eliminating the need for either ignition or combustion.

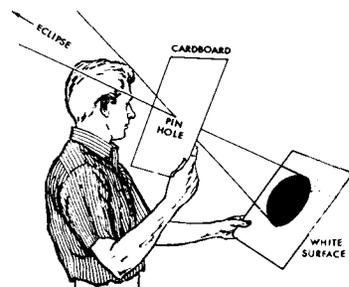
The complete system, comprised only of propellant, tank and valve, weighs 2½ pounds loaded.

Never look directly at an eclipse of the sun. You may cause serious damage to your vision, warns the National Society for the Prevention of Blindness, Inc.

During the afternoon of Saturday, July 20, the entire North American continent will be covered by the solar eclipse.

This eclipse means a serious threat to the eyesight of every person, both adults and children, who watch it directly. Children are particularly susceptible. THERE IS NO SAFE WAY to LOOK DIRECTLY AT THE ECLIPSE! Smoked glass, exposed photographic film, and dark glasses are not adequate protection.

There are several means of observing the eclipse safely; a simple way is illustrated in the diagram. Television also affords a safe means wherever the eclipse is being telecast. Persons wishing to photograph the eclipse should be certain their equipment is safe for sighting and focusing on the sun. Filters are needed on many types of cameras.



(ROCKET, from page 1) disc in Lyman-Alpha light, i.e., light from the element hydrogen.

Project scientists Drs. Kenneth Hallam and Charles Wolff said that use of the coronagraph is a new attempt to get photographs from farther out in the corona than has been ever before possible.

At Wallops Station, project scientist Larry Brace will direct a Goddard experiment to determine the effect of the reduced solar radiation upon the energy of the electrons and the neutral particles in the thermosphere. The experiment, built by the University of Michigan under a Goddard contract, will be aboard an Aerobee 300, popularly known as the Sparobee rocket.

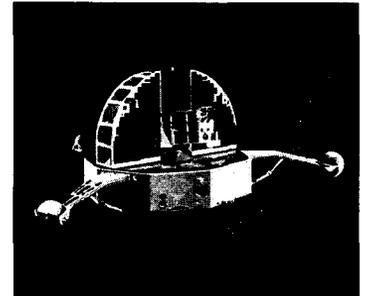
(COMET, from page 1) Mr. Secretan's personal equipment. They consist of modified long-focal Leicas carrying 35-millimeter film. The other cameras will take larger pictures. Four of the cameras and their mounts have been loaned by the Grumman Aircraft Engineering Corporation.

"We hope to photograph some stars down to the 9th magnitude," said Mr. Secretan. "Such stars are 15 times fainter than the faintest star visible to the naked eye. Stars of a magnitude less can be seen with high-powered binoculars."

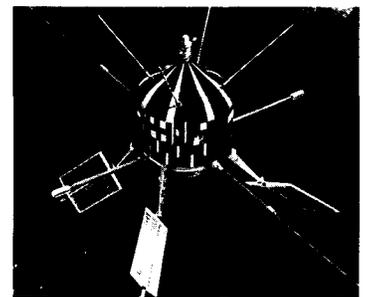
Mr. Secretan said that objects on the photographic plates that are not stars, i.e., fuzzy streaks across the plates, are "likely to be comets."

Exhibit Features Satellite Paintings

The Art Director's Club of Metropolitan Washington held its fourteenth annual exhibit last month at the Natural History building in Washington. Creative Arts Studios entered two of the artists' conceptions they painted for Goddard's visual arts branch. The two entries were OSO and UK-2, both pieces of art were accepted.

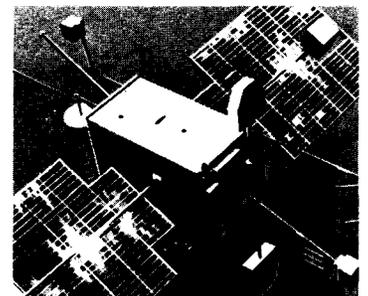


OSO



UK-2

Snowden-Nett Productions entered art for an animated sequence of the OGO film which was prepared for the photographic branch and it was also accepted.



OGO

Out of 800 pieces of art submitted, only 188 were selected to be in the exhibit.

Judging the show were, Dick Hess, Herb Lubalin and Morton Goldsholl, three of the nation's outstanding art directors.

The "Certificates of Merit Award" that were presented to Goddard for technical art can be seen hanging with pride in the offices of the visual arts and photographic branches.

A simple projector for observing the eclipse can be made with two pieces of white cardboard. A pinhole or pencil hole in the top cardboard serves to project and focus the image of the eclipse on the second cardboard. The size of the image can be changed by altering the distance between cardboards. Do not look at the sun through the pinhole.