

- Contents -

- Patricia Ax
- Graduate Study Program
- Dr. John Faulke
- Harry Press
- Dr. John W. Townsend, Jr.
- Standards Committee
- Dr. von Braun
- A & M Awards

- Ariel III
- William Dickinson
- Daniel Stern
- Terence Wollaston
- Ann Proffitt
- Stanley Kovell
- Nina Chaney
- Eileen Silvestro

- Astrodynamics
- Boy Scouts
- A & M Theater Party
- Bill Russell
- Joseph Munoz
- John Kelly
- Clarence Cantor
- George Kambouris

GODDARD NEWS

NASA/GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

VOLUME XIII, NUMBER 9

JUNE 12, 1967

ATS Links Boy Scouts Across the World



AUSTRALIAN BOY SCOUTS at the ATS ground station at Cooby Creek near Toowoomba, Australia, talk with Scouts at Goddard. The connection was made by the ATS-1 satellite and included two-way voice communication and one-way television contact from Cooby Creek to Maryland.

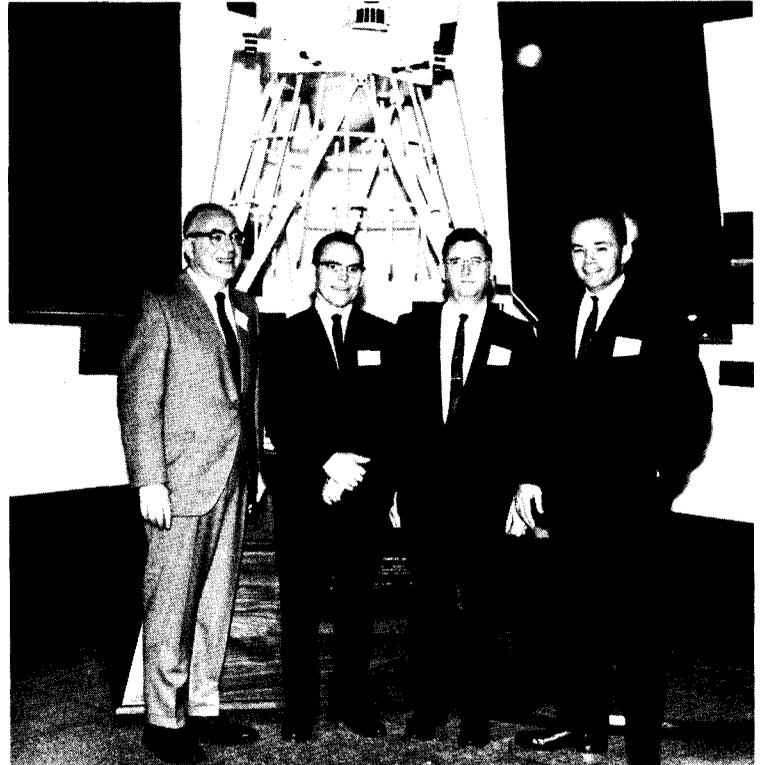


WAITING for the call, Australian Scouts sit up past 1:00 a.m. Sunday May 14 (Australian time). At Goddard, the conversation, which lasted more than an hour, began at 11 a.m. during Open House May 13.



MAKING FRIENDS, Scouts from Baltimore Troop 822 talk with Australia. On the platform from left are Mike McCarthy, Vic Casamento, Danny Soverns and Norman Bullock, son of Gilbert D. Bullock who is a member of the ATS Project Office and an Assistant Scoutmaster for the troop. Norman's twin brother, Donald, is also a Scout in the same troop.

NIMBUS II Model Presented to Smithsonian



HARRY PRESS (left), Goddard's NIMBUS Project Manager, stands by a full-scale model of NIMBUS II presented to the Smithsonian Institution, April 15, 1967, the anniversary of the satellite's first year in orbit. With him are (from left) Harry Boud and Bob Turner of General Electric, and Richard E. Roberts, general manager of GE's Spacecraft Dept.



DR. JOHN W. TOWNSEND, JR. (left), Goddard's Deputy Director is with Leonard Jaffe, NASA Director of Space Application Programs. After the presentation ceremony, Mr. Jaffe gave a brief history of NIMBUS II during which he emphasized the benefits derived from the satellite. Sidney Galler, Smithsonian Assistant Secretary, accepted the model for Smithsonian.

Astrodynamics Conference



ASTRODYNAMICS CONFERENCE. Over 130 persons from NASA, industry and universities attended the fifth biannual Special Projects Branch Astrodynamics Conference held here recently. Ronald H. Estes, Conference Coordinator, reports that many of those present were top men in their fields who had traveled from as far as Los Angeles and Seattle for the conference.



R. KENNETH SQUIRES, (left) Head of the Special Projects Branch, and Conference Chairman, discussing with Dr. Andre Deprit some interesting points brought out in his presentation "The Trojan Manifold in the System Earth-Moon."



RONALD ESTES, Conference Coordinator, and Dr. Henry Kelley, one of the contract speakers, discussing some presentation aids for Dr. Kelley's paper.

Ariel III Works 'Letter Perfect'

The experiments aboard the United Kingdom's Ariel III satellites are operating in "letter perfect order" reports Ronald K. Browning of the UK Project Office. The 198-pound, British-built spacecraft was launched by a four-stage Scout rocket from the Western Test Range, May 5, 1967.

Robert C. Baumann, Chief of the Spacecraft Integration and Sounding Rocket Division and Goddard's UK Project Manager, says, "The Ariel III spacecraft launch operations were carried out in a most professional manner by our United Kingdom friends.

"The support given the project from every area at Goddard, Langley and WTR contributed significantly to the successful program. I extend my thanks to all members of the Ariel III team."

The satellite is being tracked by Goddard's Space Tracking and Data Acquisition Network (STADAN), and its near-polar orbit has an apogee of 373 statute miles and a perigee of 306 statute miles. It orbits the earth once every 95.6 minutes and the inclination is 80 degrees. The satellite's design lifetime is about one year.

Ariel III, named UK-E before lift-off, is the third and last satellite in a series of US/UK cooperative projects. It is designed to supplement and extend investigations in the atmosphere and ionosphere conducted by Ariel I and II, launched in April 1962 and March 1964 respectively.

Management of the experiments and the spacecraft is the responsibility of the Space Research Management Unit (SRMU) of the UK Science Research Council. The Royal Aircraft Establishment, Farnborough, England was assigned technical direction of the design, fabrication and integration of the spacecraft systems. The prime contractor for the spacecraft was the British Aircraft Corp.

Goddard is responsible for overall project management, including systems management and tracking and data acquisition. Our UK team is headed by Robert C. Baumann, Project Manager; John E. Flynn, Asst. Project Manager; Dr. Siegfried J. Bauer, Project Scientist; John B. Webb, Mechanical Systems Engineer, William F. Mack, T&DS Manager, and Ronald K. Browning, Staff Assistant.



Robert C. Baumann



THOMAS P. GORMAN, Head of the Telemetry Computation Branch (IPD), speaks to a group of Scandinavian businessmen in the Building 23 Computer Room. His topic is Telemetry Data Processing Using a Univac 1108.

Meet Our People



Stanley P. Kovell

Stanley P. Kovell, Goddard's Cost Reduction Officer, is a man of varied talents with baccalaureate degrees in widely diversified fields. He is a graduate engineer with a background in chemistry, physics and mathematics. He is also a practicing attorney and member of the Virginia Bar Association as well as the American Bar Association.

He came to Goddard on January 31, 1964 from Keltec Industries in Alexandria, Virginia, where he had been a Consulting Engineer from 1962 to 1964, specializing in solar cell power supplies for unmanned spacecraft. Previously, he had worked at Melpar, Inc. in Falls Church, Virginia, from 1958 to 1962, first as a Process Control Engineer and later as Senior Engineer and Assistant Supervisor on chemical processes developed by the Melpar Minute-man Division. Prior to that time, he was a Test Engineer from 1955 to 1958 at Pratt & Whitney Aircraft, Inc., in Middletown, Connecticut, working on corrosion & hydrodynamics. As 1st Lieutenant in the U.S. Army for over two years, Mr. Kovell was Production Control Officer at Sandia Special Weapons Depot in Albuquerque, New Mexico.

At Goddard, Mr. Kovell first was Congressional Relations Specialist and later Industrial Applications Specialist before assuming his present responsibilities on July 1, 1965. Currently, he carries out and implements the NASA Cost Reduction Program at Goddard, and has the primary NASA responsibility for administrating the corporate programs of five assigned contractors: RCA, Bendix, Hughes, Fairchild Hiller, and Ball Brothers Research Corporation. He directs the cost reduction activities of Goddard's senior staff personnel with formally assigned cost reduction responsibilities, representing every directorate and division.

Born in New Britain, Connecticut, Mr. Kovell earned his BS degree in 1955 at Northeastern University in Boston, Massachusetts, and also attended Central Connecticut College in New Britain. He was awarded his Bachelor of Laws degree in 1964 at the George Washington University Law School in Washington, D.C.

In addition to current membership in the bar associations, Mr. Kovell has been a member of the American Society for Quality Control and the American Institute of Chemical Engineers. Credited with various inventions in the field of printed circuitry manufacture, Mr. Kovell has patents pending on several, including: "Method for Fabricating Printed Circuits by Selective Electroplating."

He and his wife, Sandra, live at 4933 Red Fox Drive in Annandale, Virginia.

—DATA TOPICS—

This is a summary of a paper to be presented at the IEE Communications Conference, June 12-14, 1967, in Minneapolis, Minnesota. Authors Dickinson and Stern are in Turner Wiley's Communications Engineering Branch (Nascom), and Wollaston is in the Electronic and Communication Division, Weapons Research Establishment, Salisbury, South Australia.



William Dickinson

Daniel Stern

Terence Wollaston

Voiceband Digital Communications Services in the Nascom Network

By William B. Dickinson, Daniel C. Stern and Terence C. Wollaston

The NASA Communications (Nascom) world-wide network provides operational data communications services for three satellite tracking networks: the Manned Space Flight Network, the Deep Space Network and the Space Tracking and Data Acquisition Network (STADAN). Types of high speed digital signals transmitted via voice-bandwidth channels between tracking stations, control centers and Goddard consist primarily of command, telemetry and tracking data. All of this data is assembled in blocks of various sizes; some block formats include bit error detection schemes.

During the past 18 months, over two-hundred 2400 bit-per-second (BPS) wireline modems and twenty-four 2400 BPS HF radio modems have been installed throughout the Nascom Network. As of June 1, 1967, approximately 460,000 circuit miles of wireline services (microwave, submarine cable, etc.) and 10,500 circuit miles of full-duplex voice-bandwidth HF radio services have been activated in the Nascom Network at the 2400 BPS data rate. Test equipment has been installed at most tracking stations and all communications centers to provide measurements of channel bit error rate, net loss, differential amplitude, differential delay, random noise, impulse noise and frequency shift. Some locations have been equipped with the capability of measuring block error rate, harmonic distortion, channel impulse response and phase jitter.

A large number of tests to determine the values of these parameters have been conducted in order to evaluate the performance of the network.

The test results confirm that a system design goal (excluding HF radio systems) for an end-to-end long-term average bit error rate of 1×10^{-5} can be met. Similarities and differences of long-haul circuits are discussed and analyzed in an X-Document, and parameter measurements are compared with the requirements of the AT&T 4B and the CCITT M-89 data channel specifications. The equipment and techniques used in collecting the test data are described and the limitations inherent in these measurement techniques are discussed. The applicability of these measurements to other types of data communications services is also described. The performance limitations of the present network are discussed in terms of those channel characteristics which are causing the limitation.

As mission support requirements for the Nascom Network become more demanding and computer-controlled message switching and accounting is introduced, a thorough knowledge of system error performance and the causes of these errors becomes increasingly important. A summary of present and planned Nascom effort in the areas of detailed bit error distribution analysis and real-time channel parameter measurement is presented in X-Document # X576-67-264 now available.

Goddard's Committee

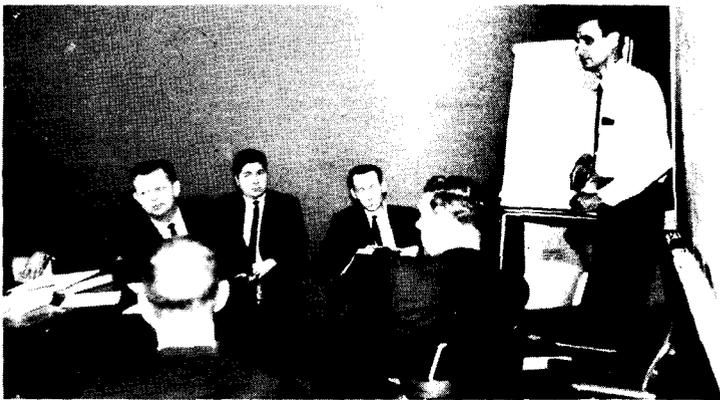


COMMAND SUBCOMMITTEE members are shown with some of the command equipment that uses DSRC standards. From left are Morton Foxe, Marvin S. Maxwell, Richard C. Lee, John Over, Edward E. Melendey, Subcommittee Chairman; and David S. Hepler.

Goddard's standards committee—officially the Data Systems Requirements Committee (DSRC)—has recently been granted its 'charter' making it the center's authority "for the establishment, publication, and review of standards for aerospace systems." In actual operation since January of 1960, the committee sets forth the guidelines used in telemetry, command and associated data systems for all scientific satellite projects using the Space Tracking and Data Acquisition Network (STADAN) and the data processing facilities at Goddard.

Dr. Robert J. Coates, Chief of the Advanced Development Division and Committee Chairman, says, "The Data Systems Requirements Committee has attempted to establish minimum acceptable levels of performance for aerospace data systems while also striving to provide sufficient flexibility to permit development of improved systems."

Initially organized as the Data Acquisition and Reduction Committee under the chairmanship of the late Morton J. Stoller, the group's first task was a comparison of Pulse Code Modulation (PCM) with Pulse Frequency Modulation (PFM) telemetry systems.



DR. ROBERT W. ROCHELLE (standing), gives a presentation on Coded PCM Telemetry before a DSRC meeting. From left (facing camera) are Elmer J. Carter, Edward E. Melendey, and Howard W. Shaffer. In foreground are Richard C. Lee (left) and John Over.

DSRC

Dr. Robert J. Coates,
Chairman
James Bailey
Elmer J. Carter,
Technical Secretary
William B. Dickinson
Morton Foxe

William F. Gallagher
Allen L. Franta
John P. Lahzun
Richard C. Lee
Leo D. Malone

DSRC

Chesley H. Looney, Jr.
Robert W. Rhodes
Christos L. Maskaleris
William W. Conant
Marc J. Selig



DR. ROBERT J. COATES (fourth from left), Chairman of the Data Systems Requirements Committee (DSRC), conducts one of the meetings that are held every two weeks. From left are Marvin S. Maxwell, William B. Poland, Dr. Robert W. Rochelle, Dr. Coates, Howard W. Shaffer, Dr. James I. Vette, William F. Gallagher, William H. Mish, and David S. Hepler.

Standards Sets 'Charter'

tems. It soon became apparent that the Goddard Space projects were all developing separate systems and that standardization was needed to cut down the duplication of ground equipment and to insure reliability. The first recommendation of the committee was that large satellites should use a PCM system while small satellites in which weight is at a premium could use the PFM system.

In January of 1962, the committee was given its present name and Dr. Coates became chairman. During that year the basic PCM and PFM telemetry standards were completed. Since that time seven more standards such as the Tone Digital Command Standard (1963) or the Spacecraft Clock Systems Standard (1964), have been added to the list bringing the total up to nine.

Today the DSRC is concerned with keeping existing standards up to date and establishing new ones to meet the needs of a constantly growing number of scientific satellites. New standards presently under consideration cover the areas of Communications, Orbit Data Format, PCM Command, Range and Range Rate, and Tape Recorder Standards.

Committee members are listed below.

Members

Marvin S. Maxwell
Edward E. Melendey
William H. Mish
Ronald M. Muller
John J. Over

Harold J. Peake
William B. Poland, Jr.
Dr. Robert W. Rochelle
Howard W. Shaffer
Dr. James I. Vette

Alternates

John C. Rodgers
Peter T. Burr
David S. Hepler
Harold H. Levy
James E. Scobey, Jr.



STANDARDS IN EFFECT. Harold H. Levy, (seated) Assistant Head of the Processor Development Branch (IPD); Jack Rivers (from left, standing), John Y. Sos, Head of the Advanced Equipment Design Section; Hubert Hinton, of the Telemetry Computation Branch; and Joseph L. Tinsley, of the Processor Development Branch; work at the Satellite Telemetry and Automatic Reduction System (STARS II) in Building 23. A unified set of standards enables systems such as this to process data from many satellites and eliminates the need for separate ground equipment for each spacecraft.



DSRC MEMBERS from left are David S. Hepler, John Over (rear), Richard C. Lee, Edward E. Melendey, James Bailey, Elmer J. Carter, Technical Secretary; Morton Foxe (rear), Marvin S. Maxwell, and William B. Poland.

Goddard's Co-op Work-Study Program, in progress since 1961, provides students with the opportunity to gain valuable work experience in the aerospace field.



Ann Proffitt: Co-op Student

Ann Proffitt, a junior in mathematics at the University of South Florida, is one of the seventy-two participants (of which three are girls) in the Goddard Cooperative Work-Study Program. She came to Goddard for her first work period in August of 1966 and has been working in the Celestial Mechanics Section of the Special Projects Branch (LTS).

Lloyd H. Carpenter, Head of the Celestial Mechanics Section, said: "The initiative and helpfulness shown by Miss Proffitt have contributed to the progress in studies of periodic orbits in the three and four body problems as well as in the computation of general planetary theories. Her cheerful personality makes it a real pleasure to have her in the Celestial Mechanics Group."

Her work involves the computer programming of problems related to celestial mechanics, mainly planet orbit determinations. When asked about her assignment, she commented, "My work with computer programming has introduced me to a new field which coincides with and adds further to my interest in math."

In high school she has a member of National Forensic League, Future Teachers of America, Phi Beta Chi (honorary science society), and National Honor Society.

Her hobbies include sewing, music, dancing, astronomy, and reading.

TECHNOLOGY UTILIZATION



TECHNOLOGY UTILIZATION. Dr. John D. Foulke (left) and Kenneth F. Jacobs, Technology Utilization Office, discuss some medical aspects of punctured eardrums.

Material Needed To Aid Healing

By Kenneth F. Jacobs

This problem was submitted to NASA by Dr. Kirchner, Department of Otorhinolaryngology, Kansas University Medical Center.

A ruptured eardrum is a painful experience but will generally heal by itself. However, if the break in the membrane is greater than 3 mm in diameter spontaneous healing will not occur and hearing may be permanently impaired.

Efforts to assist the healing process in the extreme cases are limited to the use of materials similar to cigarette paper. The paper is placed over the ruptured membrane forming a "bridge" on which new tissue may grow. The materials now used have a tendency to adhere to the new tissue making anesthesia necessary for removal. There is also a high risk the delicate membrane will be damaged in the process.

The type of material needed must be biologically stable and insoluble in body fluids. For example: teflon, methyl silicone and dacron are relatively stable; polyethylene and nylon are relatively unstable.

Since it is extremely difficult to define the specific needs in engineering terms, it is requested that persons with knowledge of a material which they believe applicable, submit a composition listing and sample for extensive evaluation by the biomedical teams, to: Technology Utilization Office, Code 206, or call extension 6242.

3/4 Credit Graduate Study Program

Goddard's 3/4 Credit Graduate Study Program is entering its sixth year. The program was originally organized with Catholic University's Space Science and Applied Physics, and Mechanical Engineering Departments in 1962. Since then the concept has proven its worth. This successful program now includes: Catholic University (Space Science and Applied Physics, Mechanical Engineering, Physics, and Electrical Engineering); American University (Physics); George Washington University (Engineering and Applied Science); Howard University (Physics); University of Maryland (Astronomy, Business and Public Administration, Electrical Engineering, Mathematics, Physics).

Interested employees should consult Goddard Announcement No. 1001, dated May 26, 1967, which indicates degree options available through the various departments indicated. Also, GMI 3410.1

dated May 12, 1967, provides the format for application.

New this year is the addition of Catholic University's Electrical Engineering Department, American University's Physics Department, and the University of Maryland's College of Business and Public Administration. This latter program opens, for the first time, an avenue of accelerated graduate study for promising professionals in the Administration and Management Directorate.

Basically, the program permits participants to carry approximately nine hours of graduate study per semester. Goddard support includes: time from work and salary, tuition, books, and certain related fees. Participants spend two full days each week on campus attending courses, studying or conferring with their professors. Several Goddard employees will receive graduate degrees this year through this program.

— PERSONALITY PROFILES —



Eileen G. Silvestro

Eileen Silvestro Does Double-Duty

Eileen Silvestro serves double duty as secretary to Fred J. Friel, Jr., GSFC Frequency Control Officer, and as "girl Friday" for the Data Systems Requirements Committee.

When asked what she thought of her job, Mrs. Silvestro said, "I have the best job in the Directorate. Actually, I have two positions and they are completely separate, but both are interesting. The Data Systems Requirements Committee (DSRC) meets on alternate Thursdays and minutes of the meetings and pertinent Standards information are distributed. The *Aerospace Data Systems Standards*, a product of this committee, has world-wide distribution. Coupled with being secretary to the Frequency Control Officer this may sound like 'all work and no play,' but with the amities of this group it is anything but."

Elmer J. Carter, Technical Secretary of the Data Systems Requirement Committee, says, "Mrs. Silvestro is indispensable in sifting through the wealth of material produced by the committee. She handles all our clerical tasks with quiet efficiency and at the same time maintains a keen interest in our work."

Mrs. Silvestro came to Goddard on September 16, 1962 as secretary to Dr. Richard Lehnert and was transferred to the T&DS Directorate Office in March of 1963. Since September 29, 1963 she has been Mr. Friel's secretary. Her affiliation with the DSRC began in November 1965.

She went to High School in Mercer, Pennsylvania, and later came to Washington, D.C. where she graduated from Temple Business College. Before coming to Goddard, she worked first as a secretary for the Federal Bureau of Investigation and then at the Naval Ordnance Laboratory.

Her hobbies are many. She has been a ceramist since 1950 and has taught classes on the subject. She fashions costume jewelry and her own clothes. She has taken courses in interior decorating, loves to cook, and is a recipe tester and collector.

Mrs. Silvestro and her husband, Joseph, live at 3600 Maureen Lane, Bowie, Maryland, with their two poodles—Pepi and Cindy Lou. They have three children. A daughter, Rosalee Fullerton, lives in Spring Hill Lake with her husband and daughter, Michelle. The older son, Frank and his wife are in Houston where he works for the Humble Oil Company. Joe, Jr. graduated from the Naval Training School at Great Lakes in May of this year and will be home for the summer.

Dr. von Braun Here for Scientific Colloquium



DR. WERNHER VON BRAUN (second from right), Director of the George C. Marshall Space Flight Center (MSFC); and his staff members listen with Dr. John F. Clark, (right) Goddard's Director; while Daniel G. Mazur, (left) Assistant Director for Technology; describes the clean room procedures in the High Bay area of Building 11. Dr. von Braun was here May 19, to talk on "Antarctica as a Lunar Logistics Laboratory" at the Goddard Scientific Colloquium.



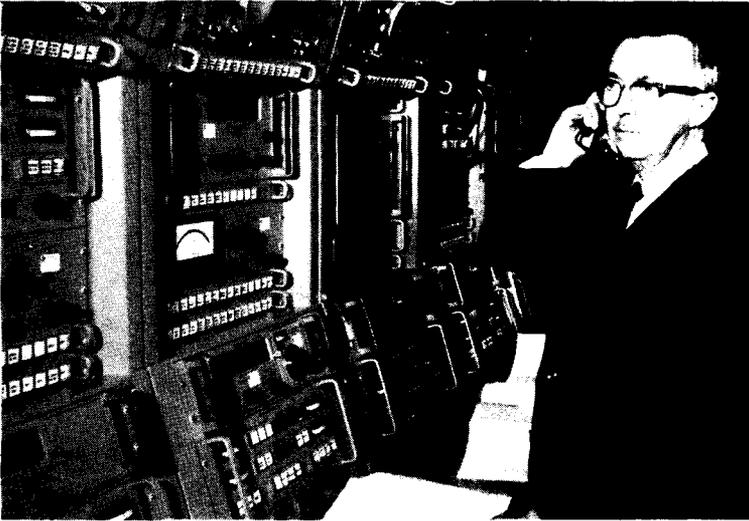
DONALD L. SCHMITTLING (right), Assistant Chief of the NASA Communications Division; points out some of NASCOM's equipment to (from left) Dr. Walter Haeussermann (MSFC), John T. Mengel, Assistant Director for Tracking and Data Systems; Dr. Clark and Dr. von Braun during the latter's tour of Goddard.



AACTF. John W. Kelly (left), of the Stabilization and Control Branch (SD); discusses the operation of the Aerobee Attitude Control Test Facility (AACTF) with Clarence Cantor, who was responsible for the design of the facility. They are looking at the pneumatic thruster package.



GODDARD AROUND THE WORLD
 —News of NASA's Worldwide Tracking Stations—



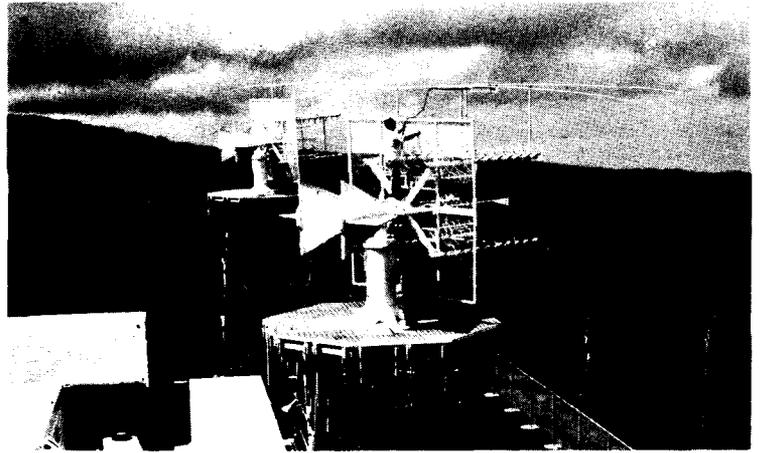
MADRID, SPAIN (MSFN). Francis I. Glynn, of Goddard's Instrumented Aircraft Section (MFOD), works at the receiver/exciter consoles. Dan Hunter is Acting Station Director.



GOLDSTONE, CALIFORNIA (MSFN). Al Norman (left), Station Electrician, and Dennis Wells, of the Antenna Maintenance Crew, are shown with a burro that wandered in from the surrounding hills and more or less took up residence at the station. Station Director is George W. Fariss.



MOJAVE, BARSTOW, CALIFORNIA (STADAN). (From left), Charles Defir, Test Controller; Charles V. Lundstedt, Station Director; and Al House, Technical Support Supervisor; are shown in front of the ATS Building. The station's 40-foot dish antenna is in the background.



HAWAII (MSFN). A cable to the HF Communications Antenna is installed. The antenna is mounted on the UHF command pedestal and antenna frame. Station Director is Virgil True.



QUITO, ECUADOR (STADAN). Students from the Colegio "La Providencia," Ambato, Ecuador, visit the DAF operations building. Eugene Young is Station Director.



ASCENSION ISLAND (MSFN). One of the British island's 42 volcanic cones and cactis are typical of the Devil's Ashpit site where the Apollo Station was built in 1965. Henry Stintz is Station Director.