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GODDARD NEWS

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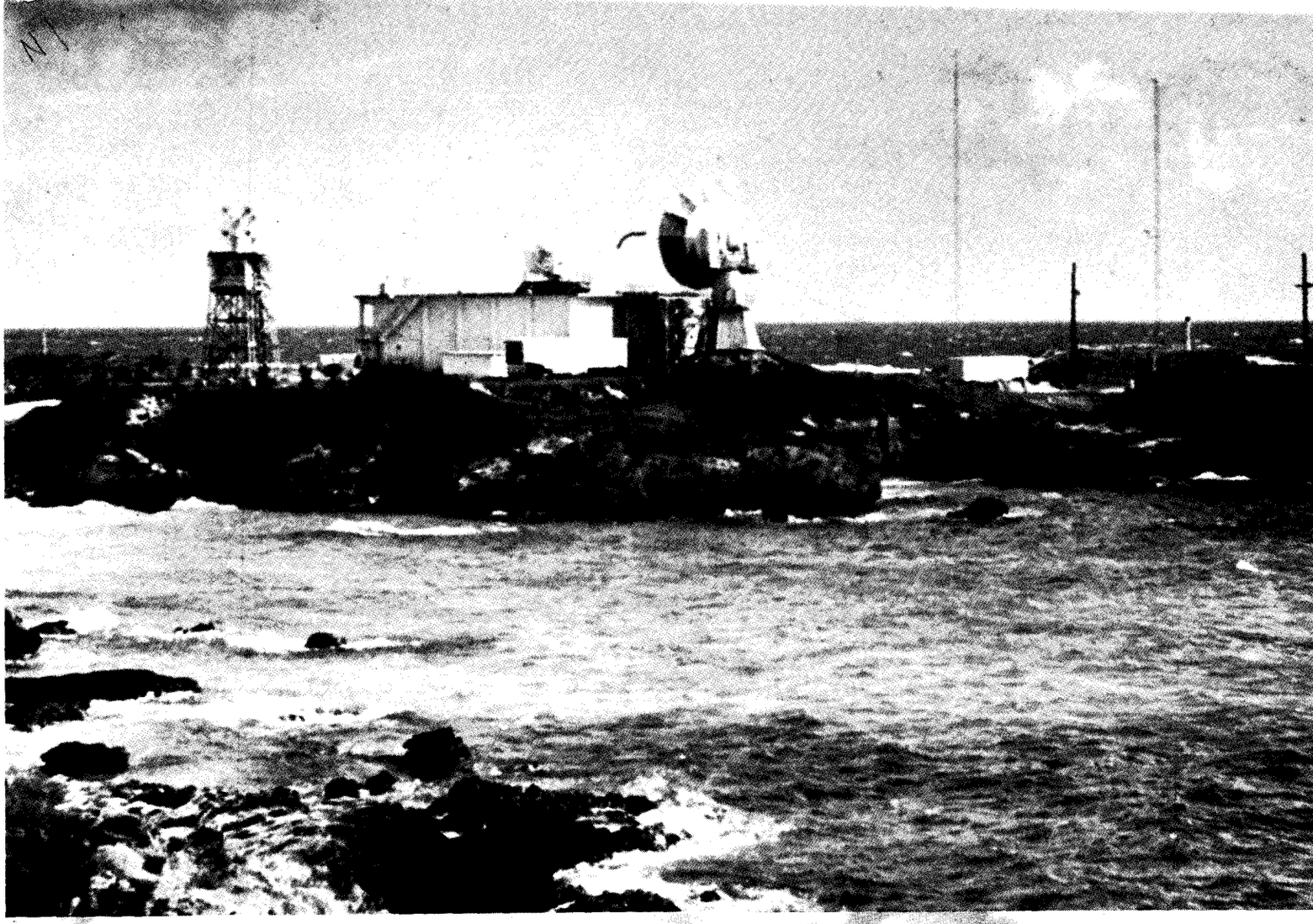

NASA 420 Instrumented Aircraft, operated by Goddard's Aircraft Operations Section, left [illegible] for the Bermuda MSFN Station (top photo) for the upcoming Apollo-6 mission. Goddard's Fred A. Healey is Acting Stadir.

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DATA TOPICS

JESSE P. ROGERS is an Equipment Specialist in the Telemetry Computation Branch (IPD). He presents here an article dealing with the capabilities and types of information processing equipment located in Building 23, the Data Interpretation Laboratory.

Data Interpretation Laboratory Equipment Guide

By Jesse P. Rogers

The Data Interpretation Laboratory (IPD) has facilities for operational processing and analysis of aerospace telemetry, and provides an integrated capability for the development and evaluation of control equipment, systems and concepts. The laboratory occupies the greater part of three floors in Building 23 here at Goddard. The ground and first floors are the operational areas and the second floor contains the research and development activities. The volume of data, number of experiments, type of modulation, telemetry format complexity, required accuracy, and the media required for distribution determine which processing methods are used. Representative or typical methods are analog tape to digital tape, analog tape to microfilm, analog tape to strip chart, and analog tape to analog tape.

In the eight chapters of the guide, now available through the Information Processing Division, Chapter I introduces the range of services available within the Central Processing Facility and provides a general guide to the variety of facility equipment used for spacecraft telemetry data reduction, interpretation, and presentation.

Descriptions of the equipment, categorized in accordance with function, appear in the following six chapters: Electronic accounting machines; Analog-to-digital data-processing systems; Analog-to-analog data-processing systems; Digital computer systems; Analog tape-evaluation systems; and Film-developing systems.

Chapter eight introduces the developmental Data Reduction Laboratory within the Data Interpretation Laboratory which will provide rapid presentation of processed data, in either "real time" or on demand, to experimenters and other users. This facility is intended to function as a workshop for the rapid generation, checkout, and modification of processing programs to meet the needs of experimenters and spacecraft operations.

The data processing equipment of the Data Interpretation Laboratory accommodates all types of telemetry currently employed in the NASA space programs.

St. Alban's Students Here

Four senior high students of the St. Alban's School in Washington, D. C. were here at Goddard recently for two weeks from 9:00 a.m. to 5:00 p.m. daily taking part in a special work-experience program setup by Goddard mathematician Elise R. Fisher in the Mathematics and Computation Branch (LTS) and carried out with the assistance of George H. Wyatt and Frederick B. Shaffer, Jr. of the same branch, together with Carl A. Wagner of the Special Projects Branch (LTS).

Miss Fisher reports that the program ended March 15, 1968 on a highly successful note: "We were very impressed with the students' depth of knowledge in computer applications and with the enthusiasm and initiative which they exhibited throughout the two weeks."

The students worked as a group and individually on various aspects of computer technology. A few of their accomplishments included: Converting a tape of data for use on an IBM 7094 to use on an IBM 360. (The data comprised planetary coordinates from the year 1800 to the year 2000.); Writing a program in FORTRAN language for solving a differential equation; Writing a program in PL/1 for solving a linear regression problem; Writing a very successful plotting program without benefit of library routines.

The program was initiated by C. A. Wight, Jr., mathematics teacher at St. Alban's School and coordinated by William F. Cahill, Head of the Mathematics and Computation Branch, with assistance from the Educational Programs Office.

ST. ALBAN'S GROUP. Goddard mathematician Elise R. Fisher with four students of the St. Alban's School; Iain Glendenning (seated), Brant Viner (from left) Peter Engelbretson, and Augistine Yokoyama.

COST REDUCTION

COST REDUCTION. Sam P. LaBarbera (center), cost reduction representative, congratulated Robert B. Johnson for saving $2700 a year. At left is Gerald E. Griffin, Head of the Management Support Branch (MSSD).

Bob Johnson Saves Goddard $2700

Robert B. Johnson, Records Management Officer in the Management Support Branch (MSSD), devised a new procedure for handling the 18,000 purchase orders and 1,250 contracts which are retired annually to the GSFC Records Depository before being sent to the Washington National Records Center.

The old method called for Center depository personnel to accept sporadic shipments which later had to be unpacked, arranged in proper sequence and numerical order, then repacked and prepared for shipment to the record center with accompanying paper work.

Gerald E. Griffin, Head of the Management Support Branch, said, "Now that the new procedure is in effect, the depository is receiving shipments which have already been sorted-out and filed in proper order for immediate forwarding to the record center without any need for unpacking, laborious re-arranging, or re-packing."

Cost reduction representative Sam P. LaBarbera points out, "This new set-up is saving Goddard 1320 manhours or a total of $2700 a year, thanks to Bob Johnson and the cooperation of procurement personnel."

2400 Hours Sick Leave

CHARLES DAVIS, of the Aerospace Experimental Machine Branch (EF&ED), has piled up 2412 hours of sick leave with the pay period ending March 23, 1968. In Federal Service 25 years, he came to Goddard in December, 1961, from the Weapons Plant where he was an experimental metal model maker.

OUR GIRL FRIDAY

Judith Marie Nimmo

Judy Nimmo joined us fresh out of high school three years ago, reports her boss Harry D. Helfrich, Head of the Flight Program Office (T&E).

"Her energy and willingness quickly overcame any lack of experience and she soon became a real asset to us. She now has the enviable record of never having missed a 'due date,' a superior accomplishment in this office."

Mrs. Nimmo schedules Mr. Helfrich's appointments, performs routine office administration; types correspondence, memorandums, reports, specifications, weekly and monthly reports for office personnel; takes dictation; maintains office files as well as the Division Test Schedule and Design Review Status Boards.

When asked what she thinks of her job, Mrs. Nimmo said: "I thoroughly enjoy my job and most of all I enjoy the people I work with."

Born in Chelsea, Massachusetts, Mrs Nimmo lived also in Ventura County, California, from the age of 7 until 14 when her parents moved to this area. She was graduated from DuVal Senior High School in June 1965 and started work at Goddard on July 6, 1965.

She is a member of the Test and Evaluation Division Social Committee, and says her favorite pastimes are baking, music, all kinds of card games, swimming, roller-skating, and race cars.

Her husband, Marvin M. "Micky" Nimmo, completed his U. S. Army basic training a short time ago at Fort Bragg, North Carolina, and is now assigned to the Quartermaster School in Fort Lee, Virginia, studying stock control and accounting.

While her husband is in the service, she is living with her parents, Mr. and Mrs. E. J. Carter Jr., at 12804 Beechtree Lane in Bowie, Maryland.

GODDARD SECRETARIES are shown during the first session of the Secretarial Techniques Course March 19, 1968, sponsored by the Employee Development Branch (MUD). More courses are scheduled for the fall 1968 semester. Mrs. Darlene Soresi, Goddard Queen, is in forefront.

First Survival Course

Over 100 Goddard employees and their wives and children completed the center's first Personal and Family Survival Course, March 7, 1968. The 12-hour course was designed to teach practical methods of survival in a nuclear fallout situation.

Among the course highlights were the actual contamination and decontamination of fresh fruit, vegetables and canned juices as demonstrated by instructor J. Daniel Moss, Director of Civil Defense Adult Education, Maryland State Department of Education; a short presentation on community civil defense planning by Prince Georges County Civil Defense Director, R. Hal Silvers; and a walk-through of the Goddard Emergency Operations Center by all course participants conducted by Goddard's Emergency Preparedness Coordinator, Ben B. Pagac.

Mr. Pagac says, "The overwhelmingly favorable reaction to the Survival Course by the participants has resulted in plans for additional courses to be presented at Goddard in the near future. This will enable employees who were unable to attend the first session to get the benefit of the excellent training offered in the Personal and Family Survival Course. New class schedules will be established and widely publicized at a later date."

BEN PAGAC (left), Goddard's Emergency Coordinator, tells course participants about the operation of the emergency medical treatment room of Goddard's Emergency Operations Center.

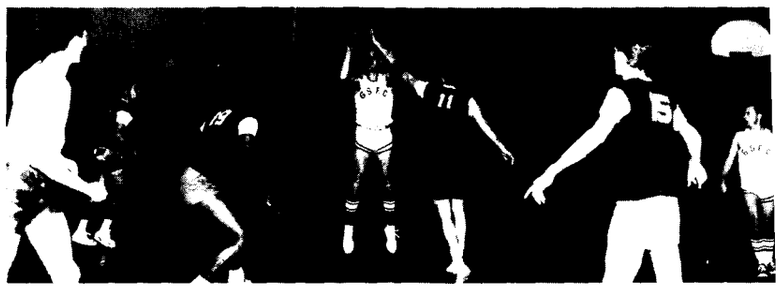
INSTRUCTOR J. Dan Moss, Maryland State Civil Defense Adult Education Director, contaminates a can of tomato juice with radioactive phosphorus-32 before demonstrating how contaminated cans of food must be cleaned and checked for radioactivity before being opened.

Green Monsters — GBL 1968 Champs

By Michael A. Calabrese

The Green Monsters once again showed why they are tops in the Goddard Basketball League (GBL) by posting 14-0 record for the season. The Monsters finally met defeat in the All-Star Game, losing 113-106 to the GBL All Stars in a well-played game. Mike James of the All Stars and Tom Gant of the Monsters were voted MVP's (Most Valuable Players) for the game. The Boosters were runners-up with a 12-2 record. The improved quality of play coupled with better team balance and officiating served to make the 1967-68 season the best in GBL's 6 year history.

GBL Final Standings: Green Monsters, 14-0; Boosters, 12-2; Lakers, 9-5; Eagles, 7-7; Mighty Mites, 6-8; C&S Tarantulas 4-10; Ringers, 2-12; and Black Cats, 2-12.



JIM STEPHENS of the Green Monsters releases a jump shot against the defending Boosters.

SUPERIOR PERFORMANCE AWARD. Robert N. Sheehy (center) of the Coating Section, receives a Superior Performance Award from N. Whitney Matthews, Chief of the Spacecraft Technology Division. Taking part in the presentation at left is Milton Schach, Head of the Thermophysics Branch. Mr. Sheehy's award was based on the design, development and successful flight of an experiment to determine whether the AIMP-E spacecraft surface would be contaminated. Measurements taken during the experiment showed that contamination occurred a few minutes after burn-out of the fourth stage.

PATENT AWARD WINNERS. Daniel G. Mazur (far right) Assistant Director for Technology, presented patent awards on March 7, 1968 to four inventors in the Spacecraft Technology Division, headed by N. Whitney Matthews (far left). The award winners are (from left): Dr. John B. Schutt, John W. Stuart, Paul W. Uber, and Eugene R. Stroup.

DATA TOPICS

RAYMOND G. HARTENSTEIN, of the Space Electronics Branch (IPD), came to Goddard in 1961 from Westinghouse. He received his BSEE in 1963 from the University of Maryland.

A Dictatable English Programming Language

By Raymond G. Hartenstein

A new processor language has been conceived by Thomas P. "Pat" Gorman, Head of the Telemetry Computation Branch (IPD). Both the processor and an assembler for this English-like language were developed by Westinghouse Electric Corporation under contract to the Space Electronics Branch of the Information Processing Division; it is presently being used to program the On-Board Processor (OBP) now slated to fly on the fourth OAO mission (OAO-C). The language has several interesting features, one of which is its complete readability and therefore self-documenting capability as an example will illustrate: LET THE PARTICLE COUNT TIMES THE EXPONENTIAL FUNCTION OF AX YIELD THIS DATA POINT. IF THIS DATA POINT IS LESS THAN THE MAXIMUM COUNT, THEN GO TO THE NEXT SAMPLE; OTHERWISE LET IT REPLACE THE MAXIMUM COUNT. A second and more interesting feature of this language is that it can be "spoken" with no loss information.

This unique property enables a person to dictate a computer program. Punctuation and identation are used to improve human understanding of the printed program, but convey no information to the computer. Programs have been dictated onto a tape recorder and later keypunched directly from the recording. In an early test of this feature several spelling errors were made in the process of keypunching, as would be expected.

It is interesting to note, however, that most of these "errors" in no way affected the correct operation of the program. This is because the error did not affect an operator and was consistent throughout the program; as an example, the word restore was consistently interpreted as restorer. The only result of this mistake was a slight distortion of the English meaning of the sentence – the program ran fine.

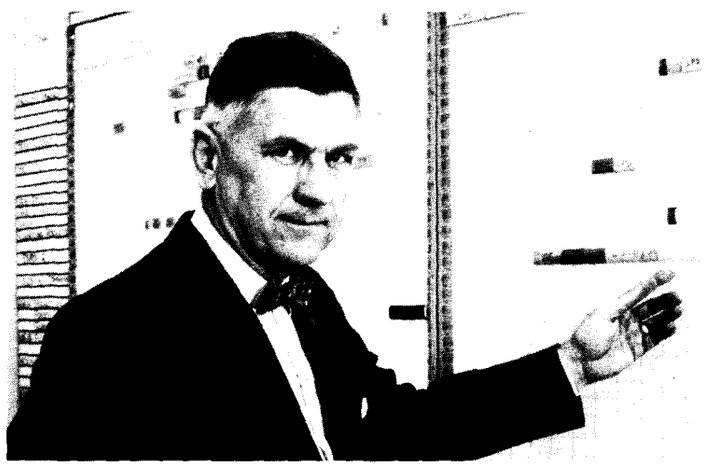
Another useful though relatively unexplored feature of the language is its adaptability to the terminology of any scientific or engineering discipline. This results from the fact that any or all of the operators can be modified by adding a single augment statement for each desired change. As an example, the ANDED WITH operator could be changed to the mathematical symbol $\cap$ or to the phrase INTERSECTION WITH or the phrase MASKED BY or to *all of these* at the same time. Hence, there is no limit to the expandability of the vocabulary of the language.

The "instruction set" for the language consists of 45 basic operators which appear as verbs in program sentences and which correspond on a one to one basis to the machine instruction repertoire of the OBP. Also, because of this one to one correlation between the operators and machine instructions, it is easy to augment a set of mnemonics similar to conventional machine language for those programmers who, for various reasons, have a preference for mnemonics. A complete description of the instruction set is given in NASA X-Document X-562-67-202; complete operations manuals are also available.

Although the language was developed in conjunction with the OBP program and therefore is bounded by the limitations of this spacecraft system, the concept is in no way unique to this system. An OBP simulator program which was developed in order to evaluate the OBP software required for the OAO-C mission is presently operational on both the SDS 920 and UNIVAC 1108 computers. This simulator allows convenient experimental use of the new language for study and evaluation purposes for anyone interested.

"Miss Pratt, take a program . . . . "

MEET OUR PEOPLE



Harry D. Helfrich

Harry D. Helfrich is Head of the Flight Program Office (T&E) and in this capacity has the responsibility for providing staff support to Goddard spacecraft projects for test activities and coordination of various test programs in the Test and Evaluation Division (T&E). He also has the responsibility for preparing the T&E Flight Program Budget.

He came to Goddard on June 1, 1965 from the Martin Marietta Corporation where he had been Director of Sales and Requirements after retiring from the U. S. Navy as a Captain in 1962.

He served most of his 23-year naval career as an aviator testing new electronics devices. His last naval assignment was Director of the Range and Astronautic Programs at the Bureau of Naval Weapons with responsibility for program management of the Pacific Missile Range and the Transit, Anna, and Spasur programs.

Born in Hagerstown, Maryland, Mr. Helfrich earned his BSEE degree at the U. S. Naval Academy in 1939 and later attended the U. S. Naval Postgraduate School where he received his MSEE degree in 1947.

He is a senior member of the Institute of Electrical and Electronics Engineers and also a member of the American Institute of Aeronautics. He also belongs to the American Radio Relay League.

His favorite pastimes are golf, duplicate bridge, amateur radio, and his home workshop.

He and his wife Diana have four children: Hope, 23, who is married and has two children of her own; David, 18, a student at the University of Maryland; Michael, 13, in junior high school; and Daniel, 7, who is in the second grade.

They live at Hickory Ridge in the Winchester area of Annapolis, Maryland.

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Jerry Stark, *Editor* Nancy Mengel, *Assistant Editor*

Patricia Ax, Ext. 4141

'Quality Assurance' Gets Division Status

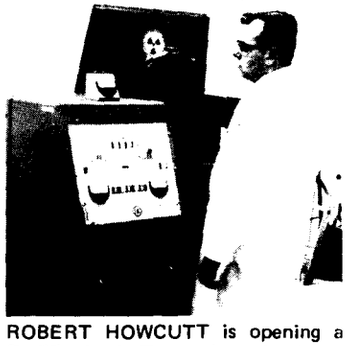
The Quality Assurance Division, formerly a branch in the Test and Evaluation Division, began operation as a division on March 8, 1968 in the Systems Reliability Directorate with Russell E. Dorrell as its Chief and George N. Kambouris, Deputy Chief.

Operating at present with close to 100 personnel, the new division conducts quality assurance programs in support of Goddard's satellite and sounding rocket projects. These programs provide pertinent quality data and information on parts, components, and usage techniques. The information and data are utilized to maximate quality considerations in the design and development of spacecraft, sounding rockets, and accompanying experiments.

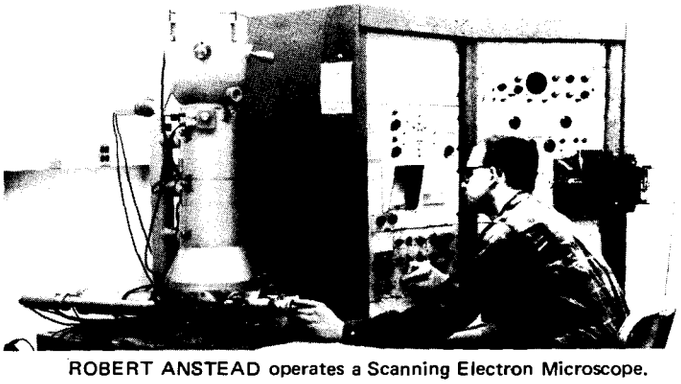
Comprising two branches, Parts and Quality Engineering, and six sections, the new division functions basically in six different areas: Applications, Failure Analysis, Inspection, Procurement Quality, and on-site and off-site quality engineering support.

For detailed information on all services rendered by the Quality Assurance Division, call George T. Clawson, Extension 2113.

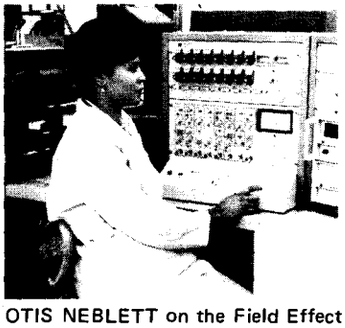
CARL MIELNIK is using the Bullion Balance Scales in mass measurement in the Mechanical Area of the Instrument Maintenance and Repair Laboratory.



ROBERT HOWCUTT is opening a Radiflo Leak Test unit to load test samples. This unit is used in the Failure Analysis Area and Incoming Test and Inspection Area.

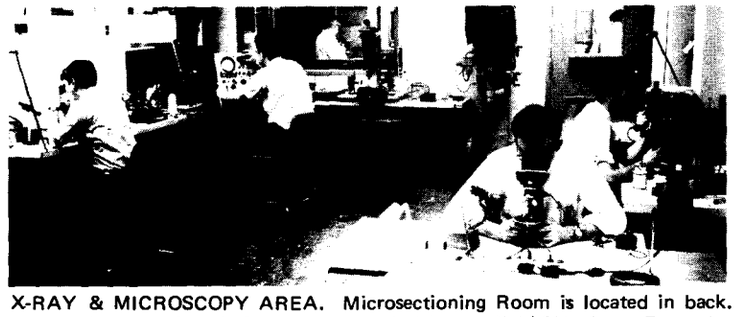


ROBERT ANSTEAD operates a Scanning Electron Microscope.

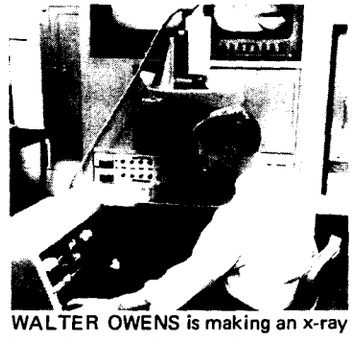


OTIS NEBLETT on the Field Effect Transistor (FET) tester located in the Incoming Test and Inspection Area.

WANDA DRAKE at the Integrated Circuit Tester located in the Incoming Test and Inspection Area.



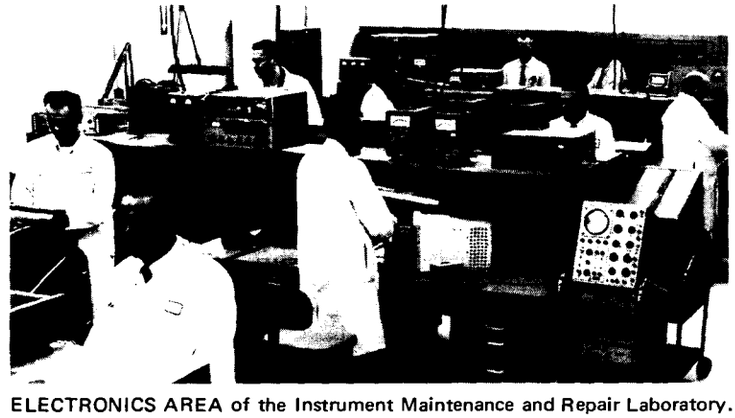
X-RAY & MICROSCOPY AREA. Microsectioning Room is located in back. From left are Edward Thomas, Ethan Goldberg, Blair Slaughter, Evangelos Angelou, Ronald Grant, and Thomas Brennan.



WALTER OWENS is making an x-ray investigation of a switch contact in the Failure Analysis Laboratory.

LISA STACY at the TACT machine utilized in the Incoming Test and Inspection Area for quantity testing of solid-state devices.

DATA STORAGE AREA. From left are Marian Thomson, George Clawson, and Virginia Massey.

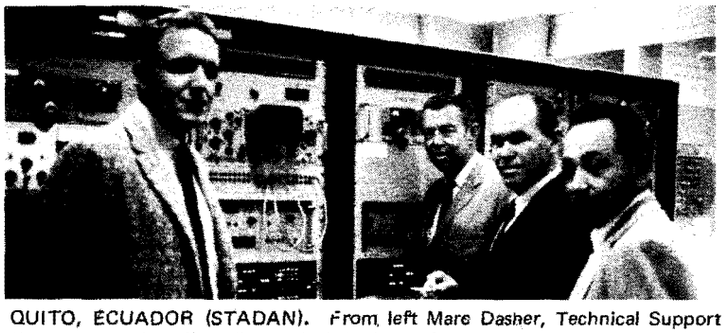


ELECTRONICS AREA of the Instrument Maintenance and Repair Laboratory. From left are Philip Raup, Donald Walker, Vernon Eisenhardt, Charles Hoopes, Lenny Baker, John Yakupkovic, John Appel, Jerry Thomas, and Fred Steiger.

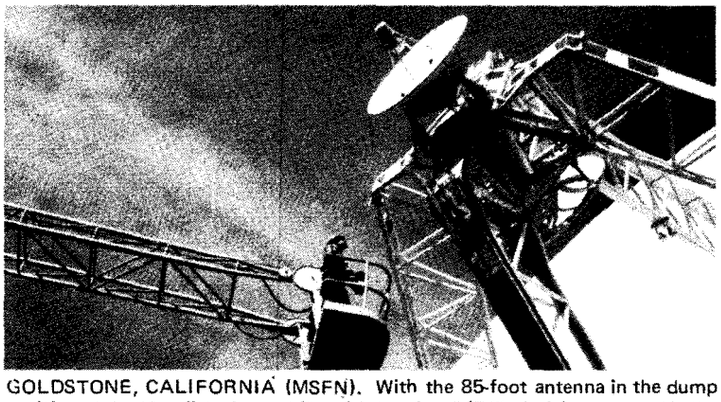
GODDARD AROUND THE WORLD

ORRORAL VALLEY, AUSTRALIA (STADAN). G. Brazier, Facilities Supervisor, checks the flow of water from a well being drilled to supply the station with fresh water. A prolonged and widespread drought in Southeastern Australia has caused the local Orroral River to stop running. Pools remaining in the river provide water for running the station, and drinking water is being carted to the station by tanker from Canberra about 40 miles away. Dennis Wilshire is Station Director.

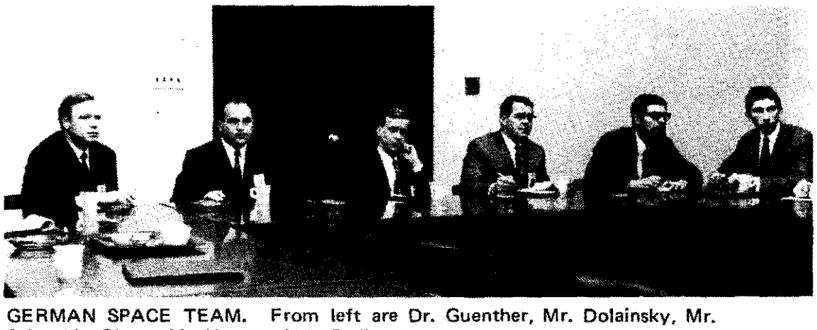
TANANARIVE, MADAGASCAR (STADAN). Ross Covington (left, second row), Deputy Station Director, is shown with students who have just completed the local OAO training course at MADGAR. The course was given by engineers who have been installing and checking out the station's OAO equipment. Students and instructors are from left (first row) Don Schartz, Jerry Day, and Fred Manning, (second row) Jim Valenti, instructor; Keith Stay, Henry Harrington, (third row) Pat Sullivan, instructor. Chet Cunningham is Station Director.



QUITO, ECUADOR (STADAN). From left Marc Dasher, Technical Support Manager; David Mitchell, Technical Operations Manager; Eugene Young, Station Director; and Robert Scalzitti, Senior Manager; pause during their daily tour around the station.



GOLDSTONE, CALIFORNIA (MSFN). With the 85-foot antenna in the dump position, John Kovalish, Jr., and Donald Douglas, R/E Technicians, ascend in the Hi Ranger (cherry picker) to inspect the ACQ AID para amp. The para amp is located at the apex of the feed horn support legs and cage. Station Director is George W. Fariss.



GERMAN SPACE TEAM. From left are Dr. Guenther, Mr. Dolainsky, Mr. Seige, Mr. Gloger, Mr. Kunz and Mr. Stalle.

German Space Team Trains Here

The United States and Germany have agreed to pursue three cooperative space programs. The first of these programs (Project Azur) calls for NASA to launch Germany's first scientific satellite into orbit with a Scout vehicle from the Western Test Range during 1969. The second program concerns an Aeronomy satellite and the third, a Solar Probe.

Under the terms of the "Memorandum of Understanding," Goddard will train German personnel in all phases of the satellite program execution, i. e., both technical and management.

Now at Goddard are ten of the first group of Germans to come for training. Dr. Pfeiffer, of Gesellschaft fur Weltraumforschung (G-fW) at Bad Godesberg, is to be the project manager of the German Solar Probe and now is receiving project management training from Paul Butler, the IMP Project Manager.

Mr. Dolainsky, of Deutsche Versuchsanstalt fuer Luft und Raumfahrt (DVL), is studying Reliability and Quality Control problems in Russell E. Dorrell's Quality Assurance Division.

Mr. Guenther, of DVL, is studying electronic instrumentation and systems planning for scientific experiments under Dr. James Trainor in the Laboratory for Space Sciences.

Mr. Kunz of DVL, is studying onboard telemetry problems with Roland Van Allen and Ed Scobey in the Space Technology Division.

Dr. Ketlsch, of the Federal Ministry for Scientific Research (BMWF), and Dr. Schneider, of GfW, are both studying contract management under Ed York, chief of the Program Support Division.

Mr. Galle, GfW; and Mr. Gloger, DVL; are both studying financial management techniques under Mr. York and Mr. Teterick. Mr. Seige and Mr. Stolle, both of DVL, are studying information processing techniques under Cyrus J. Creveling of the Information Processing Division.

PROJECT AZUR. From left are Dr. Ketlsch, Mr. Schneider, Mr. Galle, Dr. Pfeiffer and Goddard's Charles F. Rice, Jr., Project Azur Coordinator.

GODDARD COMING EVENTS

April 2:

NASA Office of Manned Space Flight Management Council meets here at Goddard.

April 2:

Technical Writing Course: Tuesdays and Thursdays from 10:00 to 12:00 a.m., in Building 16, Room 258. Sponsored by the Employee Development Branch, Ext. 6111.

April 3:

Functional English Course: Wednesdays from 10:00 to 12:00 a.m., in Building 26, Room 208. Sponsored by the Employee Development Branch, Ext. 6111.

April 3:

Special Scientific Colloquium. Dr. Jack Green, "Lunar Volcanology." Wednesday, 4:00 p.m., Building 3 Auditorium.

April 3:

Astronomy Club Meeting. Kenneth J. Frost, "Experimentation in X-Ray Astronomy." At 12 Noon in Building 1, Room 103.

April 3:

Launch of Apollo 6 from Cape Kennedy will be the second flight of the Apollo/Saturn V space vehicle. The primary purpose of this mission will be to qualify the launch vehicle for further manned Flights.*

April 4:

First Management Research Lecture Series. Dr. Marvin E. Mundel, speaker. 2:00 p.m., Management Information Center Building 8.

April 5:

Scientific Colloquium. Professor E. Margaret Burbidge, "The Spectra of Quasi-Stellar Objects." 4:00 p.m., Building 3 Auditorium.

April 6:

"A Meteorite Odyssey" by Edward P. Henderson, Curator of the Smithsonian Institution, will be presented by the National Capital Astronomers. 8:15 p.m., Department of Commerce Auditorium, Fourteenth and E Streets, N.W. Further information: J. A. Hudson, 921-2601.

April 10 and 11:

NASA Office of Space Science and Applications (OSSA) Senior Council meets here.

April 16 and 17:

Special Projects Branch Seventh Semiannual Astrodynamics Conference. Welcoming address by Dr. Theodore G. Northrop, Chief of the Laboratory for Theoretical Studies (LTS). Building 3 Auditorium. Edson F. Goodrich, Ext. 4391, is Conference Coordinator.

April 18:

Colloquium: Goddard Institute for Space Studies (GISS). Dr. E. E. Mendoza of the University of Chile will speak on infrared astronomy.

April 18:

Goddard Group Achievement Award presentation to the AIMP Project Team. 2:30 p.m., Building 3 Auditorium. Further information: Pat Greenfield, Ext. 6004.

April 19:

Scientific Colloquium. Anthony J. Weiner, "Technology and Society in the Year 2000." 4:00 p.m., Building 3 Auditorium.

April 25 and 26:

NASA Physics Board will meet in Goddard's Management Information Center.

April 26:

Scientific Colloquium. Professor Solomon W. Golomb, "Geometric Concepts in Coding Theory." 4:00 p.m., Building 3 Auditorium.

May 1:

Joint ASM-ASME-NBS Conference. "Must They Fail? An interdisciplinary look at the failure of materials in service." 8:30 a.m. to 5:00 p.m. National Bureau of Standards, Gaithersburg, Maryland.

May 1, 2, and 3:

Youth Science Congress here sponsored by NASA and the National Science Teachers Association. Twenty outstanding area high school students will present award winning papers and meet with Goddard scientists.

May 15:

Launch of the Nimbus-B weather satellite from the Western Test Range aboard a Thor-Agena rocket. Harry Press is Project Manager.*

*Launch dates are subject to change.

Special Projects Branch — Seventh Semiannual

Astrodynamics Conference

April 16 and 17 — Building 3 Auditorium

Welcoming Address: Dr. Theodore Northrop, Chief of the Laboratory for Theoretical Studies

Speakers:

A SURVEY OF COMET MISSIONS: Dr. James B. Eades, Jr., Special Projects Branch.

THE STATE TRANSISTION MATRIX INCLUDING SECULAR PERTURBATIONS: Pascuale Sconzo, IBM Center for Exploratory Studies, Cambridge, Mass.

TRANSFORMATIONS TO EXTEND THE RANGE OF CONVERGENCE OF POWER SERIES SOLUTIONS OF DIFFERENTIAL EQUATIONS OF MOTION: Dr. J. M. A. Danby, North Carolina State University.

Conference Co-Chairmen: Donald S. Woolston, Euel R. Lancaster

Conference Coordinator: Edson F. Goodrich, Ext. 4391

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.

Phil Klein: Co-op Student

Philip N. "Phil" Klein is an electrical engineering major in his junior year at Virginia Polytechnic Institute. He has worked at Goddard since June, 1965 and is presently in his sixth work quarter.

He is in the Processing and Reduction Section of the Space Data Control Branch (ADD), working on coherent optics with such things as holography and optical data processing.

Phil's supervisor, Arnold R. Shulman, Head of the Processing and Reduction Section, said, "Phil works on engineering tasks of a non-repetitive nature which have forced him to be creative. He is forming work habits which will be beneficial to him in later years."

His hobbies include music, card playing, hi-fi tinkering, and he is currently involved in building a stereo system.

Phil lives in Alexandria, Va. at the home of his parents, Bob and Marian Klein. He has two brothers and two sisters: Bernard, also a student at VPI and in the co-op program at Goddard; Jerry, who is in high school; Anne, married and living in Fairfax County, Va.; and Jean, who is in elementary school. His father, a Management Analyst, works for the Department of the Army at the Pentagon.

Management Research Lecture Series

Thursday, April 4, 1968 2:00 p.m.

Management Information Center

"The Possibilities for the Application of Work Measurement Techniques in a Research and Development Laboratory"

Dr. Marvin E. Mundel
Management Consultant

The talk will show by case studies the application of work measurement techniques to similar work environments as Goddard, and will suggest from a former Bureau of the Budget executive's point of view the advantages of using it as a firm basis in preparing program budgets. Suggestions for future topics and speakers will be welcomed. Call the Management Information Systems Branch, Ext. 5456.

*Everyone invited.

INTERESTING PEOPLE

'Bernie' Cantor: Fabrication Group Head

Bernard R. "Bernie" Cantor, Head of the Process Development and Applications Group, directs the application of new or existing processes to the solution of specific fabrication problems and the evaluation of improvements or new developments. His group prepares process data and coordinates the division's ART (Advanced Research & Technology) program in fabrication and processing.

He also is a fine photographer who developes his own black and white pictures and covers the events of two technical societies for the press and scientific publication.

Abraham Piltch, Head of the Fabrication Engineering Branch, says, "Probably the most striking characteristic of Mr. Cantor's is the degree to which he puts himself out to help others. Sitting with him of an afternoon and listening to the miscellaneous questions coming his way on materials and their applications is a revelation. The answers, when not known, are found. He deservedly has a lot of friends on the center."

Mr. Cantor came to Goddard on July 23, 1961, from the Naval Weapons Plant where he was a Supervisory General Engineer in charge of the Physical Evaluation and Analysis Section. Before this he was Head of the Nondestructive Investigations Section and he received a Navy Certificate of Commendation for the development of World War II ordnance.

Mr. Cantor was born in New York City, and graduated from the College of the City of New York in 1935 with a B. S. degree.

He is a member of the Washington Society of Engineers (WSE), The American Society for Nondestructive Testing (ASNT), and the American Society for Metals (ASM), of which he is a member of the Executive Committee for the Washington Chapter.

Mr. Cantor writes publicity releases and handles the photography for the local chapters of the ASM and ASNT and recently his pictures were featured in a Goddard News story covering the ASM Metals Science Field Day here (Goddard News, February 5, 1968).

He says, "My favorite photographic subjects are children and ducks. I took up photography about 30 years ago, and liked to photograph my son and daughter at the zoo when they were little."

Besides photography, Mr. Cantor's hobbies are tennis and table tennis.

Mr. Cantor and his wife Florence have two children: Adele, 22, and Barry, 20.

The Cantors live at 10305 Duvawn Place, Silver Spring, Maryland.

Joint ASM-ASME-NBS Conference

May 1, 1968 8:30 a.m. to 5:00 p.m.

"Must They Fail?"

An Interdisciplinary Look at the Failure of Materials in Service

Registration Fee: $10, includes cost of conference luncheon ($8 if mailed before April 21, 1968)

Seating is limited so register early!

For further information call Charles L. Staugaitis, Ext. 4833.

Held at
National Bureau of Standards, Gaithersburg, Maryland

'Smoothest GREMEX So Far'

Goddard's second GREMEX exercise in a regularly scheduled series was held here March 11-15, 1968 in the Presentation Room of the National Space Science Data Center, Building 26, with 18 Goddard participants: three players and one referee/instructor on each of four teams, plus Milton F. Denault, Exercise Director; and Henry L. Haugen on the computer.

GREMEX, the code name for GSFC Project Management Decision Making Exercise, is now part of Goddard's Career Development Program.

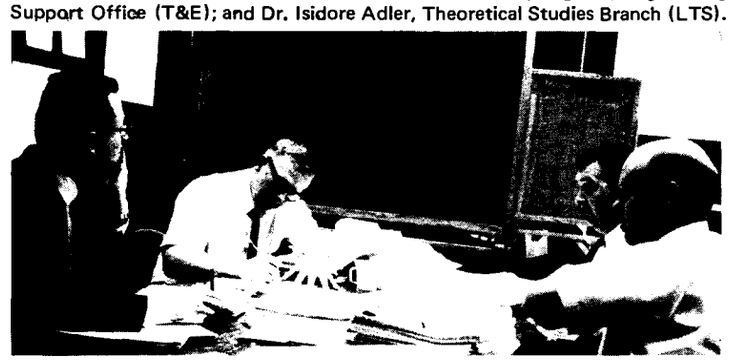
Mr. Denault reports: "The IBM 7094 computer was used, with fine cooperation from all involved, contributing to one of the smoothest exercises so far. The next two exercises, each of week-long duration, have been scheduled for April 8-12 and May 6-10 with different participants for each occasion, who have already been notified."

The primary objectives of the GREMEX computerized program is to provide technically cognizant NASA personnel with simulated experience in managing a project from a business management, rather than the technical perspective in an atmosphere where the results of management decisions can be scrutinized apart from the pressures of everyday operations, and where mistakes or management experimentation can be tolerated.

The exercise employs and makes available all of the NASA management information and control systems used by the space agency, such as PERT and Companion Cost, NASA contractor financial report Form 533, and MICS scheduling.

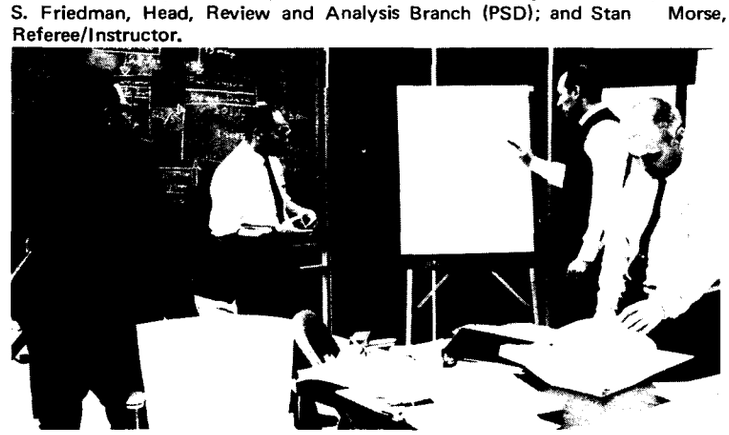
The Goddard-developed GREMEX is considered to be the first such exercise specifically developed for complex space flight projects.

TEAM #2. From left are Werner M. Gruhl, Program Support Division; Oscar W. Osvatics, NASA Communications Division; G. Russell Springham, Engineering Support Office (T&E); and Dr. Isidore Adler, Theoretical Studies Branch (LTS).

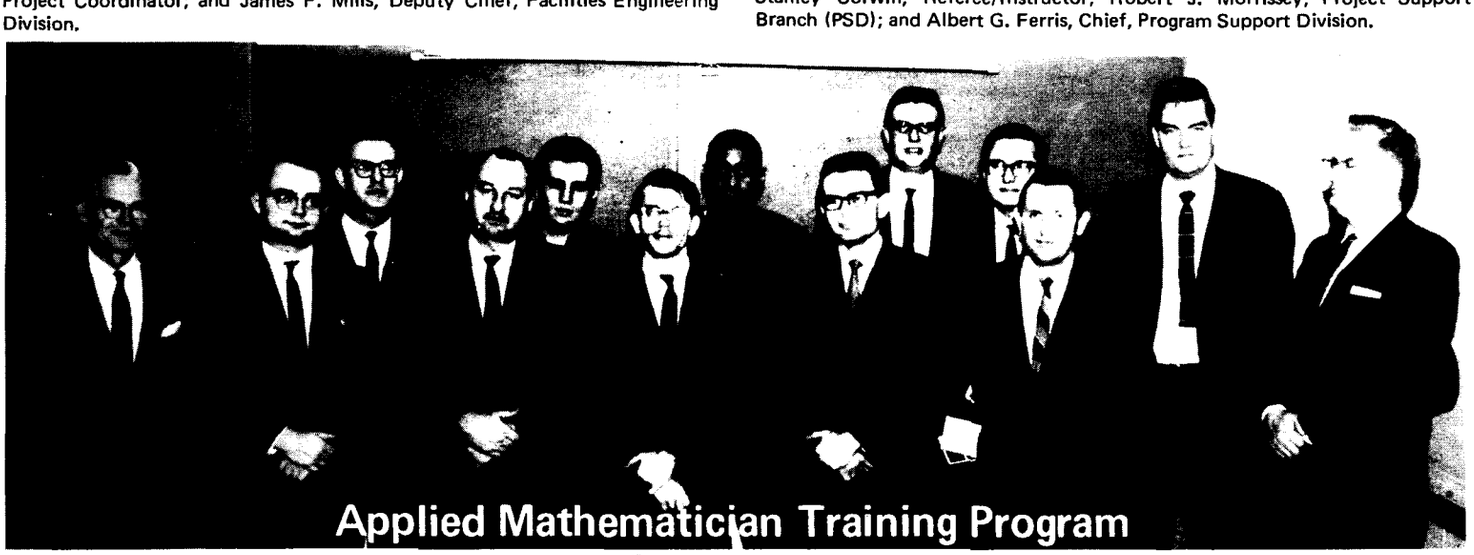


TEAM #3. From left are Chesley H. Looney, Chief, Computation Division; David W. Grimes, Laboratory for Atmospheric and Biological Sciences; Donald S. Friedman, Head, Review and Analysis Branch (PSD); and Stan Morse, Referee/Instructor.

TEAM #1. From left are Dr. Jacob I. "Jack" Trombka, Theoretical Studies Branch (LTS); John M. Bosworth, Referee Instructor; Milton F. Denault, Head, Management Information Systems Branch (PSD); William R. Limberis, IMP Project Coordinator; and James F. Mills, Deputy Chief, Facilities Engineering Division.



TEAM #4. From left are Robert O. Wales, Flight Data Systems Branch (STD); Stanley Corwin, Referee/Instructor; Robert J. Morrissey, Project Support Branch (PSD); and Albert G. Ferris, Chief, Program Support Division.



CYRUS J. CREVELING (left), Head of the Applied Mathematician Development Office; and John T. Mengel (right), Assistant Director for Tracking and Data Systems; congratulate participants in Goddard's new Applied Mathematician Training Program. From left they are Larry G. Hull, Calvin W. Curlen, Peter Krul, John S. Cavallini, Dennis M. Giblin, Joseph L. Bishop, Curtiss C. Barrett, James A. Pritchard, Herbert R. Burbeck, William M. Davenport, and William L. Cook. Not shown is Susan F. Martin. Following six months of full-time study at the George Washington University and a succeeding six-month period of on-the-job training, they will be assigned jobs as computer analyst-programmers principally in the Manned Space Flight and Tracking and Data Systems Directorates. Courses began January 29, 1968.