

Space News **ROUNDUP!**

VOL. 4, NO. 10

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

MARCH 3, 1965

MSC Employees Invited To Sessions

American Vacuum Society Seminar To Be Held Here March 18-19

The Midwest Section of the American Vacuum Society will hold its third annual meeting and seminar on vacuum science and technology at the Manned Spacecraft Center, Thursday and Friday, March 18-19.

NASA will be co-sponsor of the meeting that is expected to be attended by over 200 representatives from the midwest section of the U. S. Employees of MSC, interested in this field, are welcome to attend the sessions which will be held in the Building I auditorium. Employees of

MSC do not have to register to attend.

Howard Kimzey, Structures and Mechanics Division, is chairman of the 1965 meeting of the society, and Aleck C. Bond, manager, Systems Test and Evaluation, will welcome the group.

Papers or talks to be presented by MSC people include: "Facility Characteristics of the MSC 20-ft. Diameter Vacuum Chamber" by T. B. Leech, Crew Systems Division; "A Possible Method of Increasing Heat

Transfer to Space Chamber Cryopanel and Cold Traps" by L. D. Allen, SMD; "Description of Mission Control Center" by Joel W. Moor, Flight Support Division; and "Description of Space Environment Simulation Laboratory" by Frank A. Knox, SMD.

Other papers will be presented by representatives of industry and other NASA centers. They include: "An Ultrahigh Vacuum Chamber for Determining Thermodynamic Behavior of Certain Igneous Rocks"; "Characteristics of Cold Cathode Magnetron Gauges"; "Design of UHV Systems for Materials Testing"; "A Study of CO Absorption on Molybdenum Using Electron Probe-Mass Spectrometer Techniques"; "A System for Photo-desorption Studies"; "A Review of the Gas Species Present in UHV Systems"; and "Gas Generation by Bombardment of a Tungsten Surface in Vacuum".

The group will also hold its annual business meeting and have an installation of new officers. The papers will be presented on Thursday and a tour of MSC facilities will be taken on Friday.

Subjects: Suns And Planets

Dr. Jastrow From Goddard To Deliver Lectures Here

Two lectures dealing with solar systems and planetary physics will be delivered here at the Manned Spacecraft Center next week by Dr. Robert Jastrow, director of NASA's Goddard Institute for Space Studies in New York.

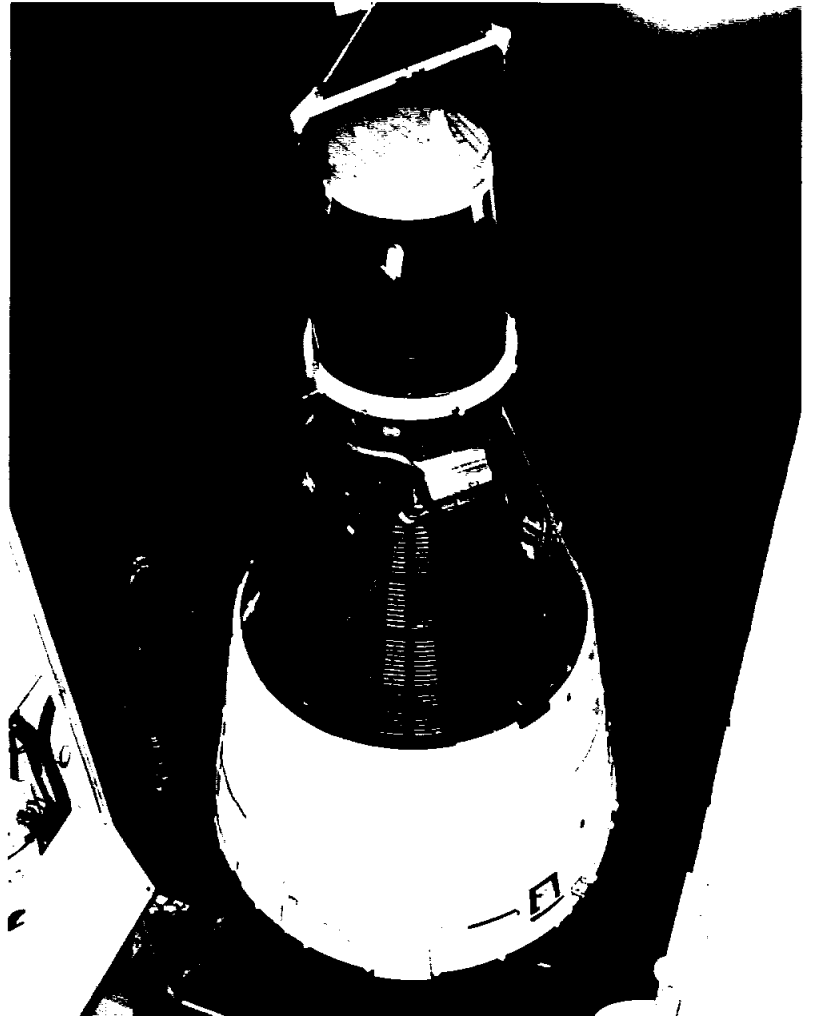
Dr. Jastrow will be at MSC, March 11 and 12 and will deliver lectures entitled "Stellar Evolution and the Origin of the

Solar Systems" and "Lunar and Planetary Physics."

The lectures will be presented in the auditorium of Building 1 at 1:30 p.m., Thursday, March 11, and at 9 a.m., Friday, March 12.

Attendance at these lectures by all MSC professional employees is being encouraged by

(Continued from Page 7)



GT-3 SPACECRAFT—Gemini spacecraft No. 3 is shown as it is hoisted to the white room above the launch vehicle on Pad 19 at Cape Kennedy, prior to the mating of the two.

More U. S. Firsts In Space Coming

Gemini Spacecraft, Launch Vehicle Mated For First Manned Flight

Gemini spacecraft No. 3, scheduled for a manned three-orbit flight early this spring, was mated to the Gemini launch vehicle on Pad 19 at Cape Kennedy, February 17.

A series of tests of the combined vehicles, including simulated launches and flights, are being conducted to insure flight readiness.

With the launching of the GT-3 flight, more firsts in space will be in the making for the United States. It will be the first spacecraft placed in space by any nation that will be able to change its plane in orbit, as well as change the size of the orbit.

Astronauts Virgil I. Grissom
(Continued on Page 6)

Special Night For The Ladies Of MSC



LADIES NIGHT—Over 150 ladies from the Manned Spacecraft Center attended the special Ladies Night, February 17, in the Auditorium. Here, George M. Low, deputy director, MSC, chats with some of the ladies before the program started. The various programs at the Center were explained by Low; Charles W. Mathews, manager, Gemini Program Office; and Dr. Joseph F. Shea, manager, Apollo Spacecraft Program Office.

Roundup Publication Date To Change To Friday

The publication date of the Roundup will be changed from Wednesday to Friday, beginning March 19, which will be the next issue.

Changing the publication date to every other Friday was done to eliminate overtime that was necessary on weekends to meet printing schedules for a Wednesday issue. This change was made in line with the cost reduction program of NASA and the Manned Spacecraft Center.

Final deadline for copy under the new publication date will be as follows: news of employees activities, deadline will remain the same, 4 p.m., Wednesday (the week before publication); all other copy, noon Friday. Cooperation is requested in meeting these deadlines and copy turned in earlier will receive more thorough attention by the editor.

Ranger 8 Takes Photos Of Possible Apollo Landing Area



The Ranger 8 spacecraft crash landed on the surface of the Moon in the early hours of February 20, but not before it had taken over 6,000 photographs of the lunar surface in 23 minutes, and helped to provide more information on

possible landing sites for the Apollo astronauts.

Below is the launch vehicle and spacecraft at lift-off from Cape Kennedy, February 17, on the 65-hour, 234,000-mile journey to the Moon.

The area photographed by Ranger 8 was in the Mare Tranquillitatis — the Sea of Tranquillity — which is in the east central portion of the Moon as viewed from earth.

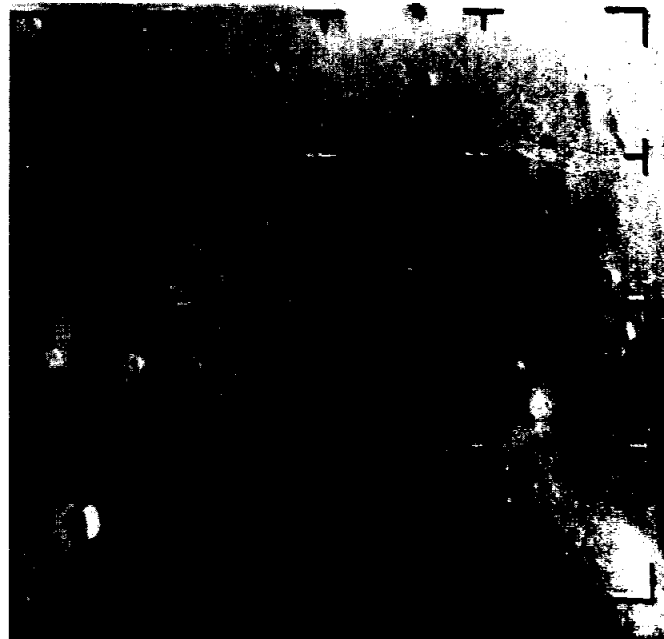
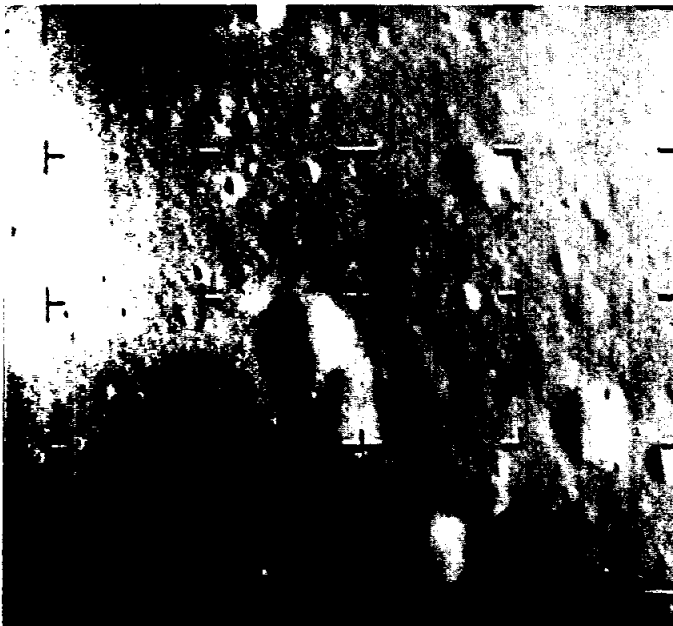
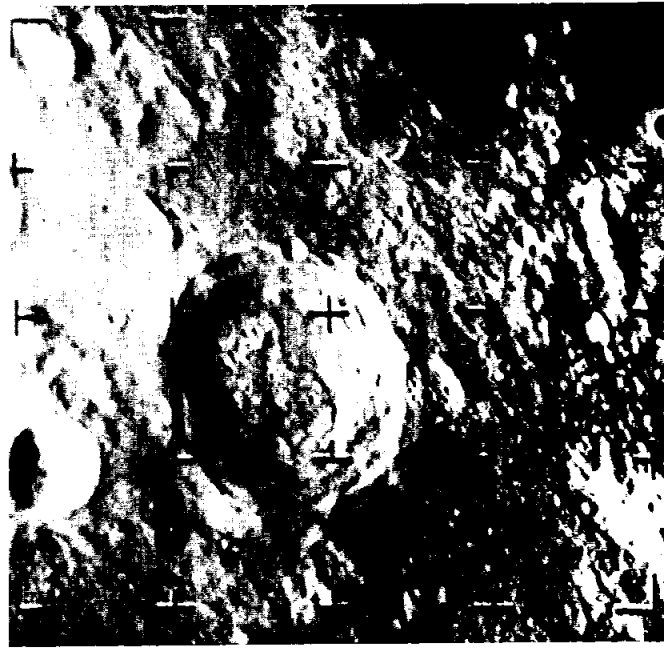
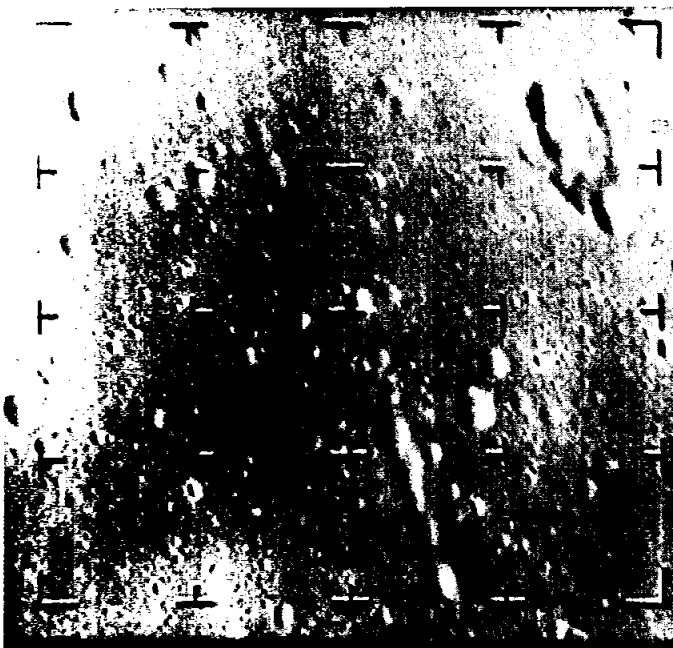
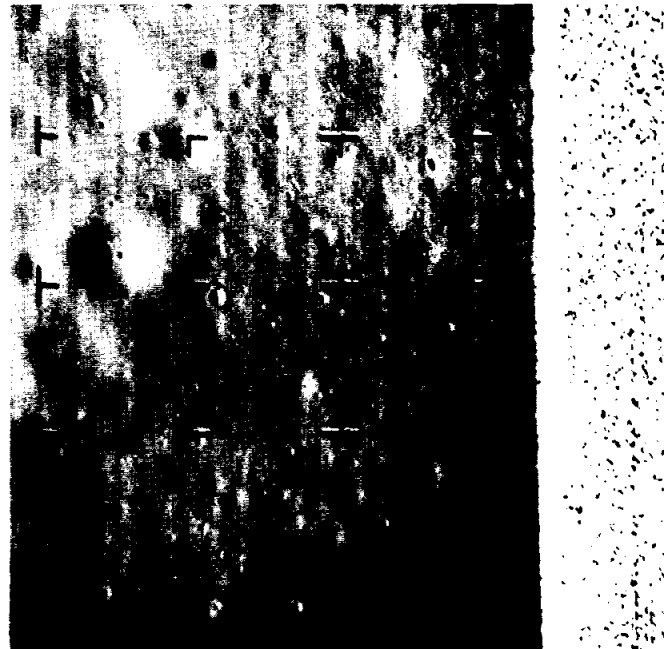
The photos on the left, were taken by Ranger 8 and transmitted to Earth. North is at the top of the photos when shadows appear to the left of craters.

Starting at the top left and going down, the photos are: (1) The 27th from last frame of A Camera, taken 2:15 minutes before impact, showing an area 77 by 67 miles from an altitude of 151 miles. This is the southwest corner of the Sea of Tranquillity showing large flat bottomed craters Sabine and Ritter, two cone craters at left, low ridges in upper left (northeast) and rills parallel to lower shoreline.

(2) The 47th from last frame on B Camera, four minutes before impact, shows a 58 by 43 mile area from 270 miles up. The shore line of the Sea of Tranquillity is shown with Sabine in the northwest corner. Two parallel rills cross the center part (similar to Terrestrial graben). Several elongated craters are probably due to Theophilus, 250 miles to the southeast.

(3) The ninth from last frame of B Camera, taken 45.6 seconds before impact. Altitude of 50 miles, shows an area 12 by eight and one-half miles. Two elongated and irregular depressions are visible.

(4) The fifth frame from last of B (Continued on Page 3)



(Continued from Page 2)

Camera, 25.13 seconds before impact, shows an area six and one-half by four and one-half miles, from 27 and one-half miles up. The irregular cluster of depressions are shown in the northeast corner of the previous print and a smaller square depression.

(5) Starting top right and going down. The last frame from Camera P-3, taken from 2400 feet up, 0.4 seconds before impact, and showing an area 400 by 300 feet. The smallest crater shown is about five feet in diameter.

(6) The last frame from A Camera, 2.09 seconds before impact, from an altitude of 12,000 feet, shows an area 4500 feet north-south. The photo resembles Mare Cognitum that was photographed by Ranger 7.

(7) The 81st frame from the last of B Camera, taken about seven minutes before impact from 470 miles up, shows an area 93 by 71 and one-half miles. Delanbre

crater, 32 miles in diameter, is near the center of the frame, the highlands are at right, the sea shore is at upper right.

(8) The last frame of B Camera, 4.65 seconds before impact, at an altitude of 5.1 miles, shows an area 4000 by 3000 feet. The larger crater in the southeast corner shows small craters and rocks on slope. A dimple crater is shown above it. The crater in the southwest corner has a steep wall and central ridge.

Adjustment MSC-KSC Employee Strength Being Implemented

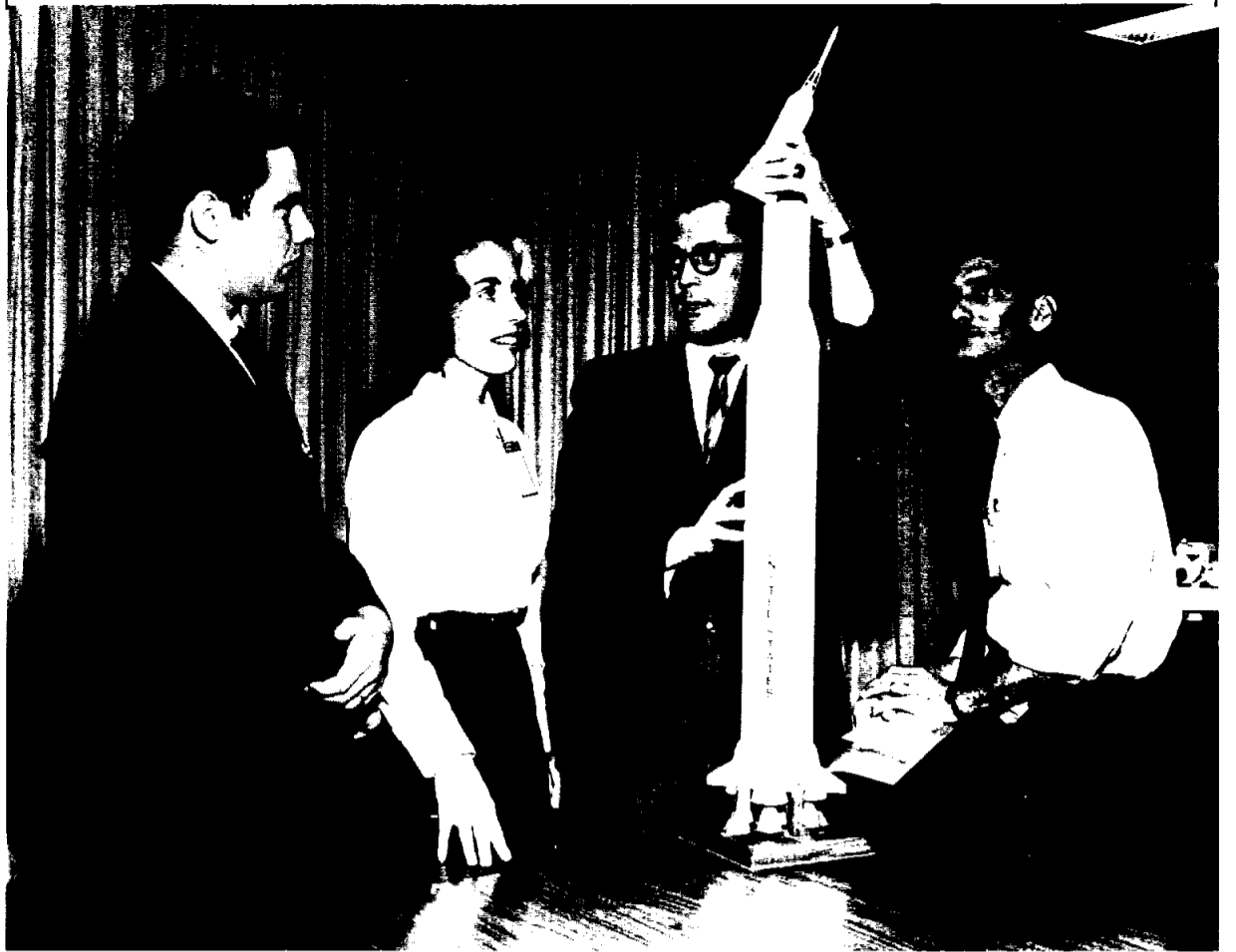
Implementation of an adjustment in the employee strength between the Manned Spacecraft Center and the John F. Kennedy Space Center, Cape Kennedy, Fla., began early last month with the transfer of 41 engineers and mathematicians here.

The employee change is in line with an Office of Manned Space Flight directive which transferred the MSC Florida Operations Office to the Kennedy Space Center. Twenty-five members of the Electronic Ground Support Equipment Division at Kennedy are relocating with the Information Systems Division, Engineering and Development Directorate here.

Another sixteen engineers from various divisions of Florida Operations will work in the Apollo Project Office in spacecraft checkout duties.

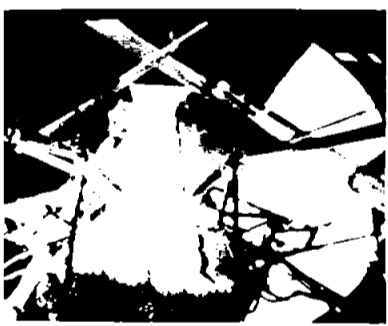
A third group of 52 persons are being recruited from Florida Operations by the Apollo Office for spacecraft factory checkout at the North American Aviation

New MSC Employees Receive Space Orientation



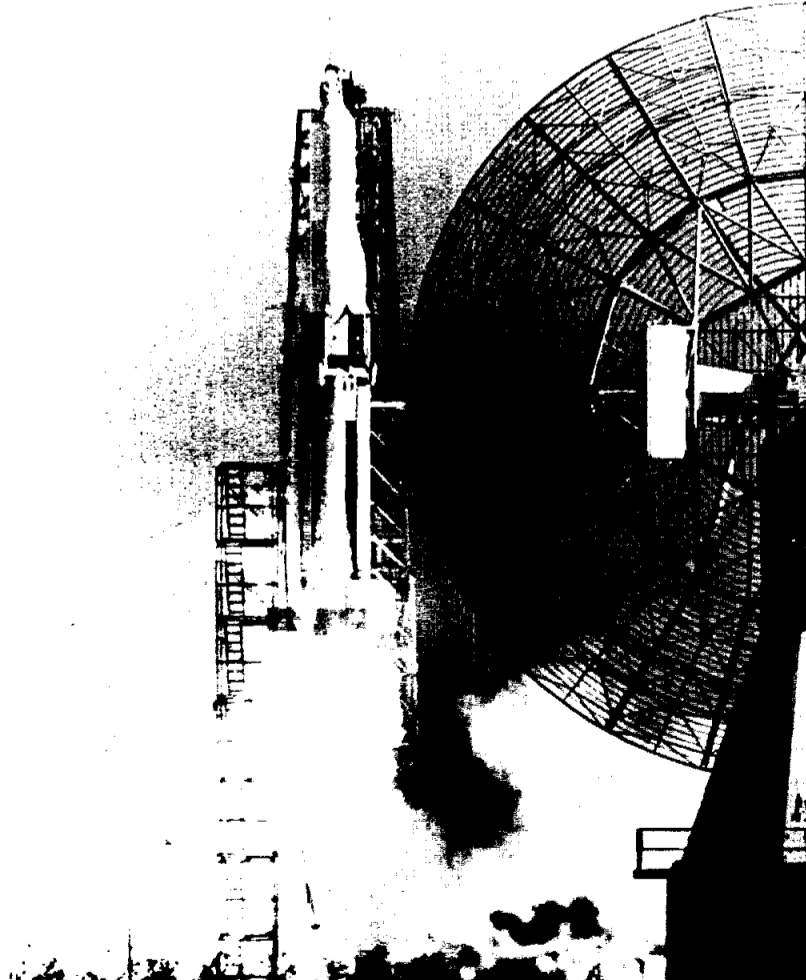
EMPLOYEE ORIENTATION—New employees here at the Manned Spacecraft Center are shown as they receive an orientation on various aspects of the space program from Elwood Johnson (center) of the NASA Spacemobile Operations. New employees are (l. to r.) David L. Hench, Ann G. Sabin, and William C. Douglas. The new employee orientation program is under the direction of Personnel Division's Training Branch.

Onboard TV



PEGASUS DEPLOYMENT — This series of photos (top to bottom) taken by the onboard TV camera shows: (1) jettisoning of the shroud that enclosed the Pegasus satellite, moving straight off the S-IV second stage, exposing the Pegasus for deployment. (2) As the shroud moves farther away it appears as a small moon object at top of picture. (3) Deployment starts, spreading wings consisting of seven hinged frames per wing by a spring loaded device. (4) final photo shows the satellite locked in its final position for orbiting the earth.

Eight In A Row For Saturn



SA-9 ON ITS WAY—The Big Saturn leaves the pad at Cape Kennedy on its way to orbit the Pegasus meteoroid satellite. The 96-foot-span wings unfolded as planned and appear to be functioning properly. The only Apollo spacecraft test during the launch was the jettisoning of the launch escape tower utilizing the tower jettison motor shortly after second stage ignition, about two and one-half minutes after launch. The big antenna at the Mission Control Center is shown in the right foreground.

Co. plant in Downey, Calif., and the Grumman Aircraft Engineering Co. plant in Bethpage, N. Y.

Family moves are being coordinated by the MSC Personnel Office and the transfer is expected to be completed by early April.

Astronaut Assignments Told

Nearly half of NASA's 28 astronauts at the Manned Spacecraft Center are training for the next three flights of two-man Gemini spacecraft, all scheduled to fly this year.

Astronauts Virgil I. Grissom and John W. Young are command pilot and pilot, respectively, for Gemini-Titan 3 (GT-3), due for a three-orbit trip from Cape Kennedy early this spring.

Astronauts Walter M. Schirra Jr. and Thomas P. Stafford are doing identical training as back-up pilots for GT-3.

The second manned Gemini flight, GT-4, will have Astronauts James A. McDivitt and Edward H. White II at the controls for up to four days in orbit. Astronauts Frank Borman and James A. Lovell Jr. are their back-up crew.

Astronauts L. Gordon Cooper Jr. and Charles Conrad Jr. are the GT-5 crew, scheduled to orbit a Gemini spacecraft for up to seven days. Back-up crew for this mission is Neil A. Armstrong and Elliot M. See Jr.

Other assignments for the remainder of the NASA astronaut team include:

Donald K. Slayton, assistant director at MSC for Flight Crew Operations.

Alan B. Shepard Jr., chief of the Astronaut Office.

M. Scott Carpenter, U. S. Navy Project Liaison for special projects.

Seven astronauts are assigned to Project Apollo in these areas:

Richard F. Gordon, branch chief, responsible for overall astronaut activities in the Apollo area, and for liaison in connection with development of the Apollo command and service modules.

Donn F. Eisele, command

and service modules and lunar excursion module (LEM).

William A. Anders, environmental control systems, radiation and thermal systems.

Eugene A. Cernan, boosters, spacecraft propulsion and the Agena stage.

Roger B. Chaffee, communications, flight controls and docking.

R. Walter Cunningham, electrical, sequential and non-flight experiments.

Russell L. Schweickart, in-flight experiments and future programs.

Six astronauts are assigned to Operations and Training:

Edwin E. Aldrin Jr. is branch chief, responsible also for mission planning.

Charles A. Bassett II training and simulators, operations handbooks.

Alan L. Bean, recovery systems.

Michael Collins, pressure suits and extra-vehicular activities.

David R. Scott, guidance and navigation, mission planning.

Clifton C. Williams Jr., range operations, deep space instrumentation and crew safety.



For Gemini And Apollo Beckman Instruments Supplying Me

With the liftoff of the first manned Gemini spacecraft, specialized medical flight monitoring equipment will enable physicians on the ground to monitor remotely the physiological condition of the astronauts during every moment of their historic flight.

Portions of this advanced biomedical instrumentation are now under development for the National Aeronautics and Space Administration by Beckman Instruments, Inc., a leading commercial manufacturer of scientific instrumentation and a participant in every major U. S. aerospace program.

At the Manned Spacecraft Center, the company's contributions range from flight hardware to ground systems that will be used in test and simulation programs in support of the Gemini and Apollo series, and beyond.

The new Beckman physiological instrumentation for Gemini is designed for use aboard the spacecraft during the entirety of its earth-orbiting mission.

One of the units, the Cardiovascular Reflex Conditioning System, will be used in an experiment to determine if the venous and arterial system in the lower limbs can be artificially stimulated during periods of prolonged weightlessness. The unit, which will be worn within the suit of one of the two Gemini astronauts will inflate a cuff surrounding his thigh at regular intervals.

Working automatically and continuously during flight, the unit is designed to help prevent "blood pooling" in the lower extremities during and after the astronaut's return to a gravitational field.

Another of the physiological

units, the Phonocardiogram Systems, will monitor the heart sounds of the astronauts. Operating as a remote stethoscope, the system will monitor, record and prepare heart sounds for transmission to earth continuously during flight, thus giving a heartbeat by heartbeat check on the condition of the astronauts.

Also scheduled for inclusion on the Gemini flight is a Beckman electroencephalograph unit for monitoring brain waves. Data collected by the system will be telemetered to earth where it will be used to determine the alertness of the astronauts at specific times during the mission.

A pioneer in life support instrumentation, early Beckman developments included a series of oxygen and carbon dioxide sensing devices for Project Mercury. The equipment was used to monitor the atmosphere of the vehicle and suit circuit continuously during the flight. Any change in the oxygen or carbon dioxide levels of the cabin or suit were instantly displayed to the astronaut and were relayed to the ground by telemetry.

Another instrument, a miniaturized gas chromatograph, was developed to monitor and display 10 selected contaminants in a closed atmosphere. The instrument, which weighed less than 12 pounds as opposed to some 150 pounds for a standard laboratory gas chromatograph, utilized a new, high sensitivity

detector to enable trace detection of a large number of components in the parts per million range.

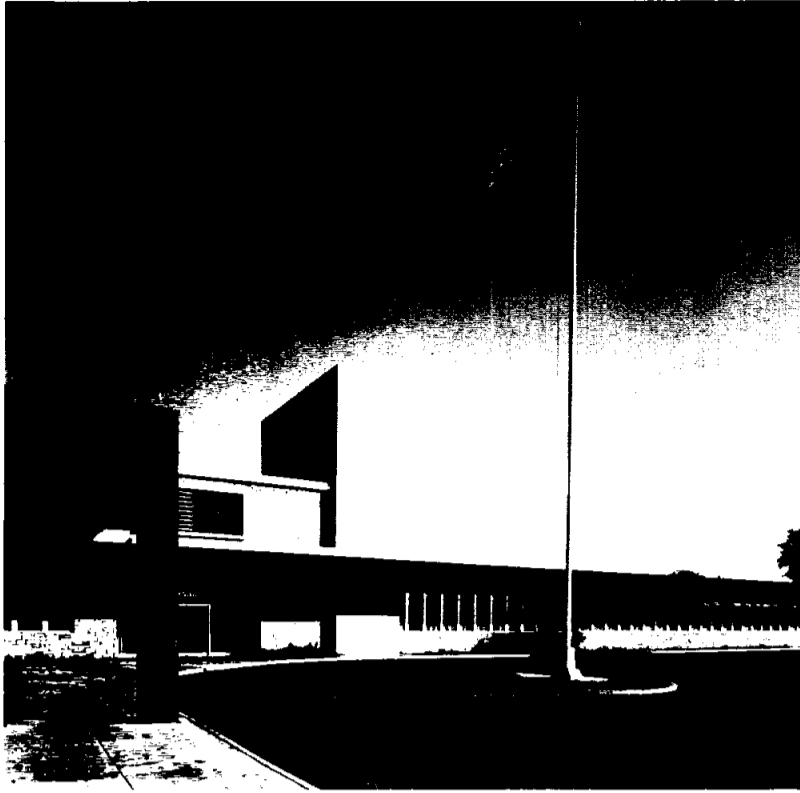
Now under development at Beckman's Fullerton, Calif., laboratories is a safety instrumentation package to be worn by personnel who will be working inside the Apollo high-vacuum space simulation chamber now under construction at the Manned Spacecraft Center. The safety monitoring package will be built into a vest to be worn inside closed-atmosphere space suits.

The system will consist of a network of physiological and biomedical measuring devices and amplifiers which will monitor personnel continuously while they are inside the chamber. A cable attached to the vest will connect to control panels outside the chamber, indicating immediately any change in the wearer's condition or malfunction of his space suit.

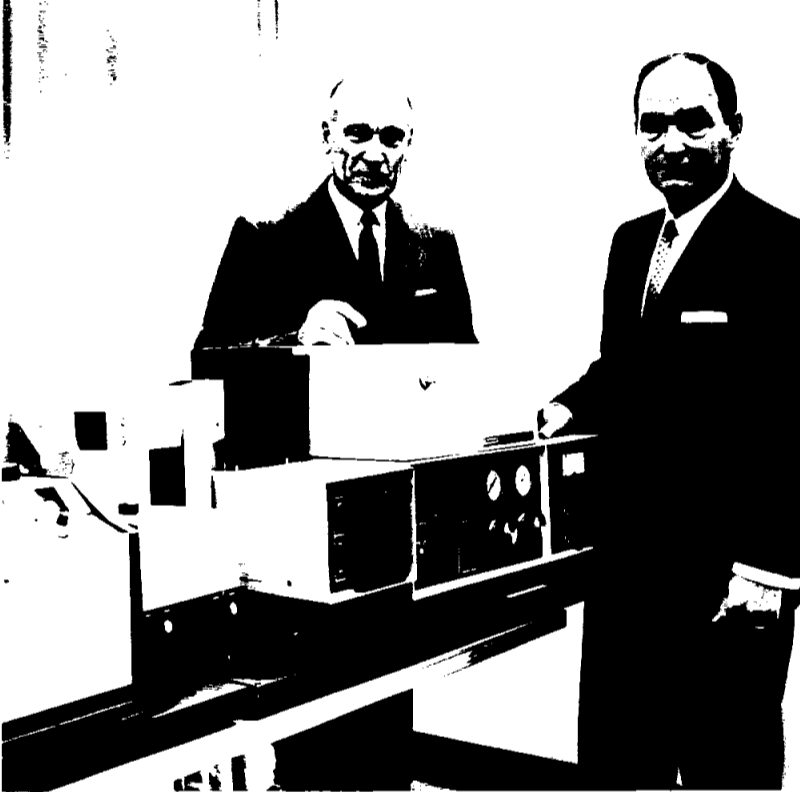
In another area, the data will be displayed for physicians who will be alert to any physiological or biomedical abnormality that could indicate danger.

The safety system will record heart and respiration signals, body temperature and blood pressure, in addition to monitoring the oxygen and carbon dioxide levels of the closed-atmosphere suits. The system also will monitor the suit's total pressure to assure that it is properly inflated.

A different type of Beckman



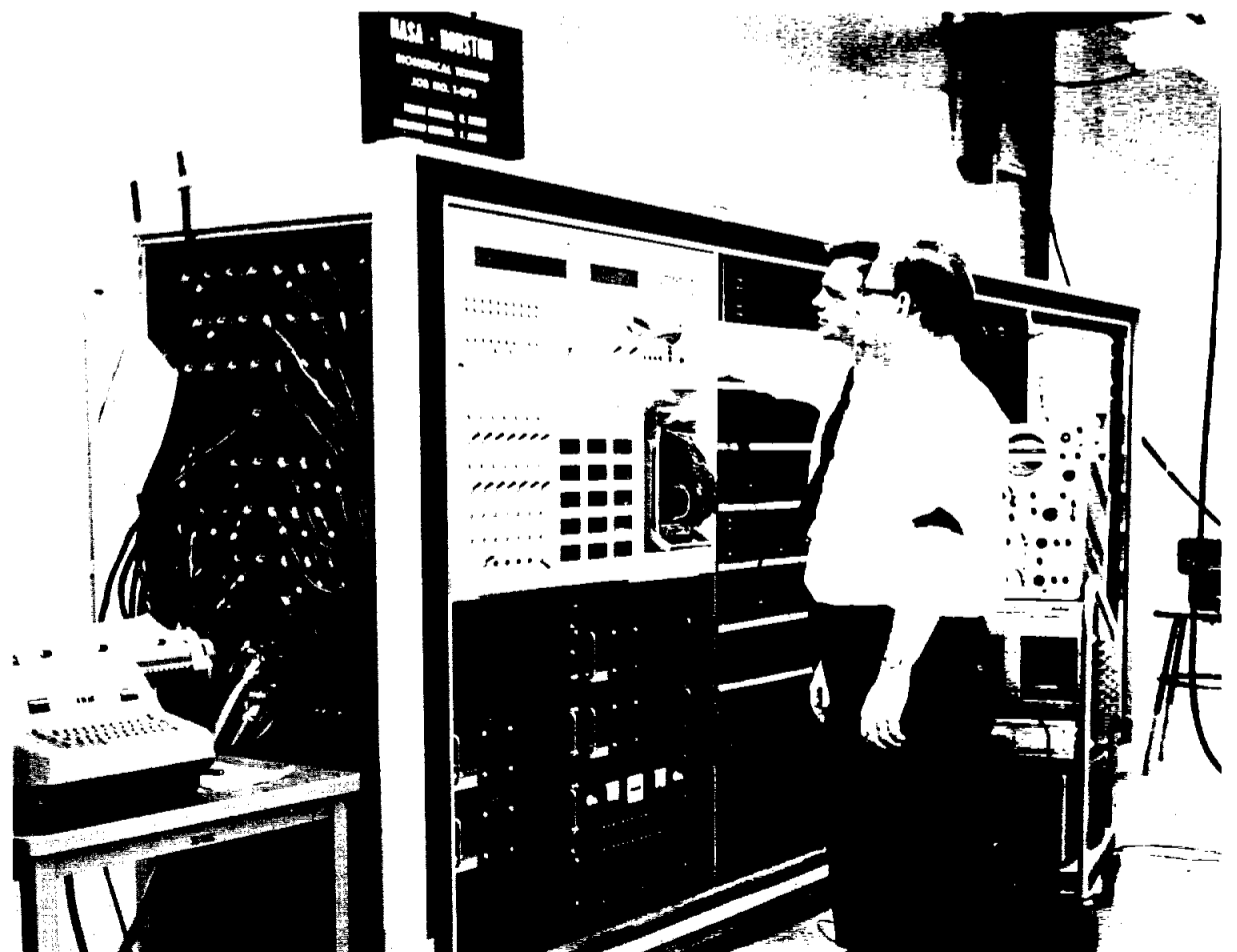
HEADQUARTERS SITE—This is the main approach to the 67-acre, Fullerton, Calif., headquarters site of Beckman Instruments, Inc. The site is location for four of the company's major divisions and some 3,400 employees.



COMPANY OFFICERS—Dr. Arnold O. Beckman (left), board chairman and chief executive officer, and Dr. William F. Ballhaus, president of Beckman Instruments, Inc., inspect new Atomic Absorption Analyzer used to accurately measure trace metals in parts-per-billion concentrations in body fluids, lubricants and other substances.



PIONEER INSTRUMENTATION—Walter Donner, manager of Beckman's Space Engineering Department, Fullerton, Calif., displays oxygen and carbon dioxide sensing systems used to monitor atmosphere of Project Mercury spacecraft.



SYSTEMS CHECKOUT—Engineers of Beckman's Systems Division, Fullerton, Calif., checkout data acquisition system being used at MSC in studies to determine the physiological reactions of man to the simulated environments of space.

EDITOR'S NOTE: This is the fortieth in a series of articles designed to acquaint MSC personnel with the Center's industrial family, the contractors who make MSC spacecraft, their launch vehicles and associated equipment. The material on these two pages was furnished by Beckman Instruments, Inc.

35 Students Enroll For Spanish At Language Club's First Session

The first class meeting of the MSC Language Club was held February 23 in the executive dining room of the Cafeteria with 35 students in attendance.

Spanish is the language now being studied by the group with Sue Null as instructor. In addition to learning the languages of various countries, the club plans to study the culture, customs and geography.

Plans to organize the group were made in January, with two business sessions conducted by Merv Hughes of the Employees Activities Association. Officers were elected, a class teacher chosen, and the meeting date of the first class was set.

Wes Brenton is president of the group, Mary Jo Thibodaux, secretary, and Sharon Davis, treasurer.

The Language Club has been officially sanctioned by the EAA Executive Board to meet in MSC facilities and to use the NASA-MSC title. EAA is also furnishing financial support to the new group.

Meetings are held each Tuesday beginning at 5 p.m., in the MSC Cafeteria executive dining room.

The next language group to begin will be studying French. To express your interest in the study of French and to obtain more information on the MSC Language Club, contact Judith A. Guy, Ext. 7405.

Water Ski Club Announces Plans For Active Season

The Water Ski Club here at MSC has announced plans for an active summer season of regularly scheduled outings beginning in March.

Instructions for beginning and advanced skiing will be available at these outings.

The club will also participate in a series of novice tournaments at the Nassau Bay Yacht Club. The first of these tournaments is scheduled for May 29.

The next scheduled meeting of the club will be a dinner meeting, held at the Pizza Joint, Old Galveston Road, in South Houston, March 4.

For additional information call Barbara Arabian, Ext. 3581.

Kanak Heads Area Federal Safety Council



NEW SAFETY HEAD—John M. Kanak (right), assistant chief for Safety, MSC Center Medical Office, was recently elected chairman of the Houston-Galveston area Federal Safety Council. Kanak took office at a February 18 luncheon meeting of the group. Here, Arnold E. Mouish, deputy director of the Houston Veterans Hospital, turns over the gavel to Kanak.

Reservations Still Being Taken For EAA Children's Ice Skating Party

Reservations are still being taken for the second annual MSC Employees Activities Association Children's Skating Party to be held from 1 to 3 p.m., Sunday, March 14.

The cost is only \$1 per person and includes skate rental, and refreshments. All MSC children and their friends are invited. Children under 10 must be accompanied by a parent.

Tickets may be purchased from any EAA district repre-

sentative.

Transportation will be furnished to and from the Winterland Ice Rink, 2400 Norfolk. Buses will leave from the SAGE parking lot, 8555 Gulf Freeway (Exit 13) at 12:15 p.m., and return at about 4:45 p.m.

Parents are asked to have their children dressed warmly.

For more information on the party, contact Paul Liebhardt, Ext. 5441, or Flora Byars, Ext. 3881.

Service Awards Presented By Dr. Gilruth



15-YEAR AWARDS—Dr. Robert R. Gilruth (center) recently presented awards for 15-years of government service to Dr. Charles A. Berry (left), chief, Center Medical Programs, and to Astronaut Donald K. Slayton, assistant director for Flight Crew Operations.

MSC Secretaries Attend Seminar



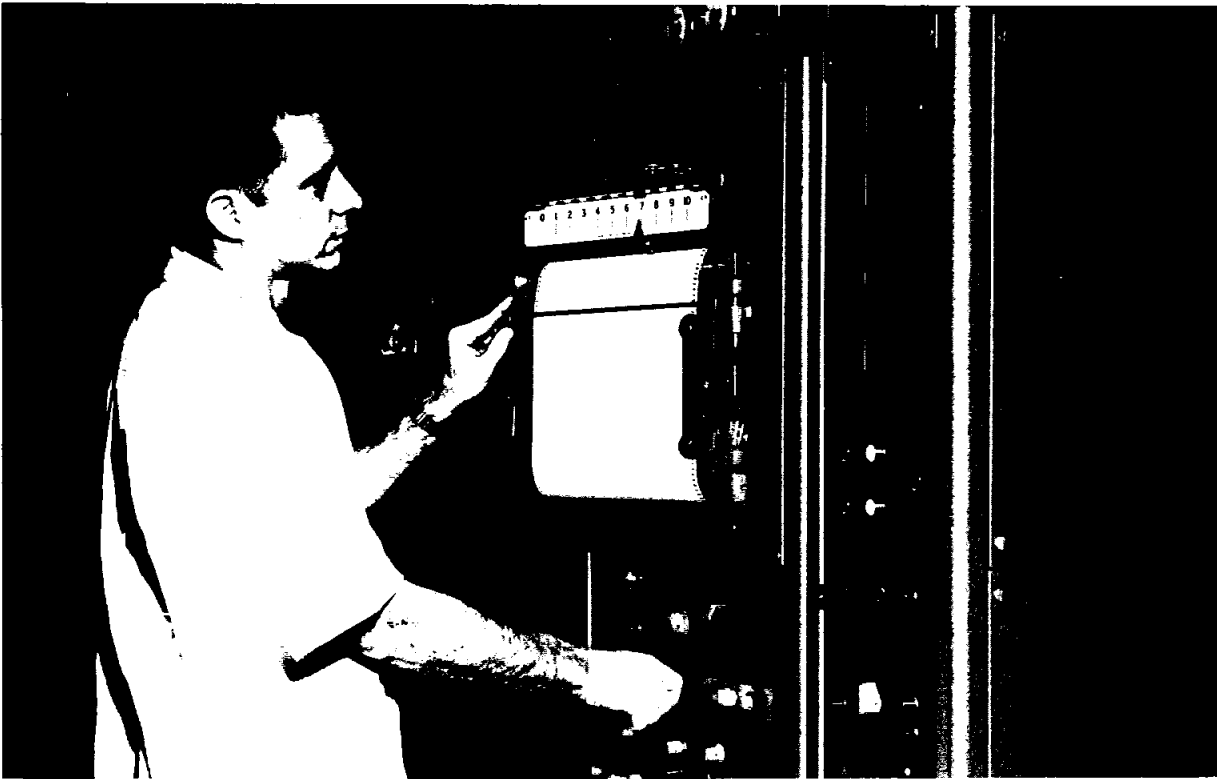
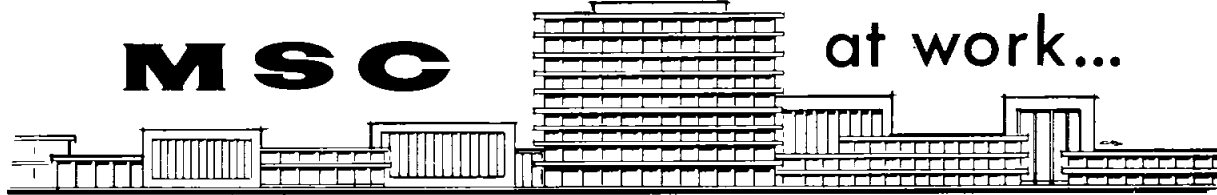
SECRETARY SEMINAR—Among the attendees, from the Manned Spacecraft Center, at the 2nd Annual Secretarial Seminar of the National Secretaries Association, in Baytown, were (l. to r.) Phoncille De Vore, Doris Kreske, and Iva Scott. Also attending from MSC were Wanda Slack, Lois Bradshaw, and Madeline Withoff.

Suggestion Winners Presented Cash, Certificates

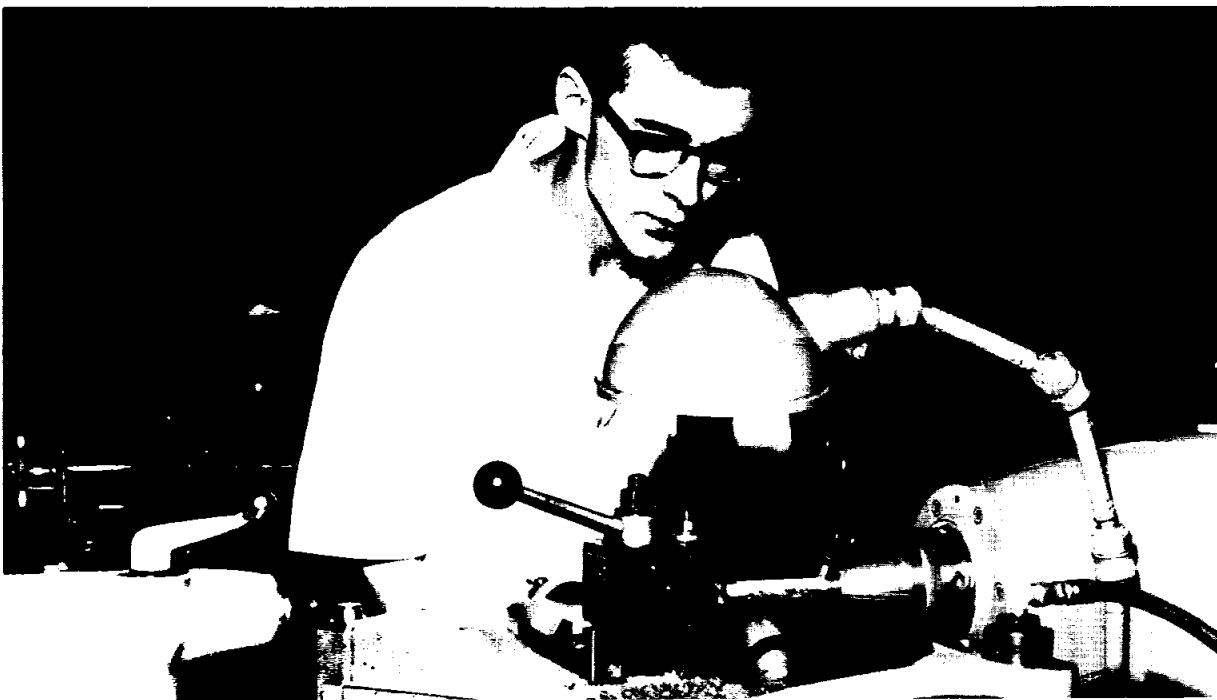


AWARD WINNERS—Suggestion award certificates and cash were presented recently to employees at the Resident Apollo Spacecraft Program Office, Bethpage, N. Y., by Dr. Joseph F. Shea, manager, of Apollo. Shown are (l. to r.) Frederick A. Zito, Guidance and Controls; Sharon K. Bridges, secretary; Shea; Henry Carleton, Electronic Systems. Total cash awarded for the suggestions was \$55.

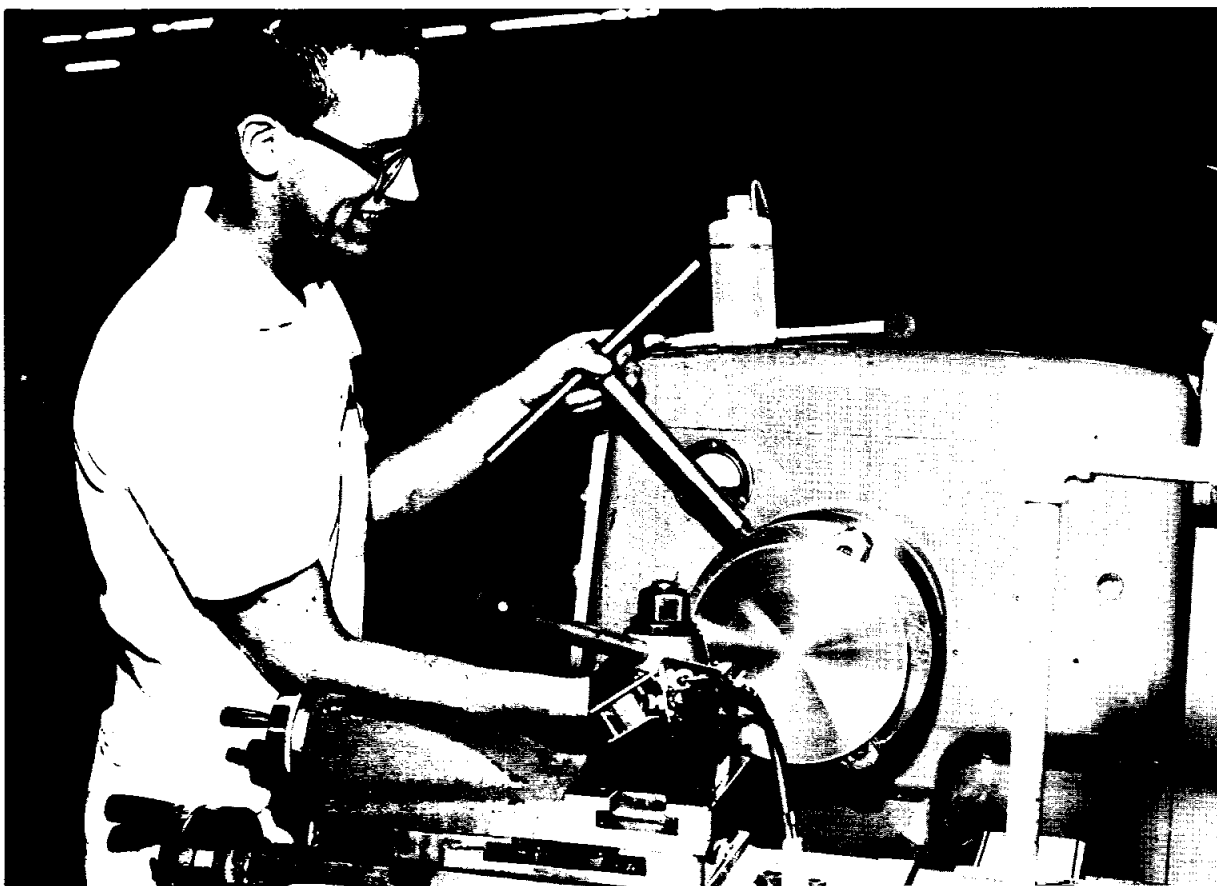
MSC at work...



JIM McBRIDE, Experimental Structures Section of Structures and Mechanics Division, operates an Instron tensile testing machine, performing a test on a prototype friction shock absorber for Apollo.



JOSEPH M. SCHMITT, apprentice machinist, Machine and Assembly Branch, Technical Services Division, operates a tool-room lathe as he repairs a handle for use on one of the machines in the shop.



CLARENCE J. FISCHER, apprentice machinist, Machine and Assembly Branch, Technical Services Division, operates a lathe as he makes an aluminum cover for a vacuum tube.

Photogs See Camera Demonstration, Portraits To Be Subject of Next Meet

A demonstration of the use of cameras and presentations of close-up photography were on the program of the bi-weekly meeting of the Photographic Club February 18.

Meeting in the east conference room of Building 1, the group saw a demonstration of the use of single-lens reflex cameras with bellows and normal and long focal-length lenses in close-up photography.

In two categories of point competition on the subject of close-up photography, the results of the evening's presentation were: Color Transparencies, first place went to Bob Jones, and second and third place to Fran Johnson; Black and White Prints, first and second place to Fran Johnson.

The presentation of results of block assignments was postponed until the next meeting.

Rod And Gun Club Sets Special Election, Constitution Meeting

A special meeting for final approval of the constitution, by-laws, and the election of officers, has been scheduled by the Rod and Gun Club here at the Center.

The meeting will be held at 4:45 p.m., March 11, in Building 16, room 324. The entire membership of the club is urged to attend.

More information may be had on the meeting by calling Dewey Hydrick, Ext. 4771.

The club meets again tomorrow at 7:30 p.m. and the program will be on portrait photography. Members and visitors are invited to bring samples of their work in this field, members for point competition.

For more information on the Photo Club's activities, or membership, call Ken Cashion, Ext. 7673, or Fran Johnson, Ext. 3584.

Calendar Of Events, Winners Told By Bridge Club

The Duplicate Bridge Club's calendar of events for March will include two Master Point games: the Club Master Point on March 2, and a Charity Game on March 16.

March 9, 23 and 30, games will be regular rating point games and will count toward the series winner.

Phyllis and Joe Duke won the Mixed Pair Championship of the Duplicate Bridge Club on February 16. Second place was a tie between Max Cone and Rita O'Boyle and Wayne and Elizabeth Brewer.

Winners at the February 9 rating point game were: North-South - W. H. Hamby and Floyd Bennett, first; Jim and Sharon Raney, second; East-West - Bob and Terry Hodgson, first; R. Clark and R. Bliesner, second.

MSC BOWLING ROUNDUP

NASA MIXED LEAGUE		Alley Oops	8	8
White Sands Operations		Fireballs	8	8
Standings as of Feb. 18		Fabricators	7	9
TEAM	WON LOST	Green Giants	7	9
Goofballs	22 1/2 5 1/2	Pseudonauts	0	16
Roadrunners	21 7	High Game: Grimwood 244, Peterson 244, Amason 233.		
Bad Guys	16 12	High Series: Lee 645, Morgan 629, McBride 587.		
Pinbusters	15 13			
Misfits	11 17			
Scatterpins	10 18			
Woodbusters	9 19			
Good Guys	7 1/2 20 1/2			

High Game: J. Winn 243, B. Tillett 224, T. Matuszewski 223.
High Series: B. Tillett 626, B. Colston 596, T. Matuszewski 561.

MSC COUPLES LEAGUE

Standings as of Feb. 23

TEAM	WON	LOST
EZ-GO	17	7
Goofballs	16	8
Schplitz	16	8
Wha' Hoppen?	14	10
Pin Splitters	14	10
Bltzf	13	11
Alley Cats	11 1/2	12 1/2
Bowlernauts	11	13
Sandbaggers	11	13
Crickets	10	14
Hi-Ho's	6 1/2	17 1/2
Thinkers	6	18

High Game Women: J. Foster 228, K. Gentile 224.

High Game Men: J. Garino 246, D. Kennedy 244.

MIMOSA MEN'S LEAGUE

Standings as of Feb. 18

TEAM	WON	LOST
Spastics	11	5
Technics	11	5
Roadrunners	10	6
Sizzlers	9	7
Whirlwinds	9	7

NASA 5 O'CLOCK MON.

Standings as of Feb. 15

TEAM	WON	LOST
Foul Five	49	31
Suppliers	47	33
Computers	44	36
Hot Shots	38	42
Sombreros	37	43
Alley Gators	27	53

High Game: W. Kutalek 244, M. Cohn 230, C. Waters 225.
High Series: H. Erickson 595, E. R. Walker 591, H. Walker 569.

MSC MIXED LEAGUE

Standings as of Feb. 15

TEAM	WON	LOST
Celestials	62 1/2	21 1/2
Virginians	54	30
Alley Cats	53	31
Dusters	41	43
Falcons	40 1/2	43 1/2
Chugg-a-Luggs	40	44
Shakers	40	44
Play Mates	40	44
Gutter nuts	38 1/2	45 1/2
Eight Balls	36	48
Hawks	35 1/2	48 1/2
Goofballs	27	57

High Game Women: Barnes 225, Smith 192, Gasset 179.
High Game Men: McDonald 245, Morris 230, Schmidt, Zwolinski, Sargent, Morgan 221.

Medical Flight Monitoring Equipment

product, a giant data acquisition system, is being used at the Manned Spacecraft Center to study the physiological reactions of man to the simulated environments of space. The system is used to collect data remotely from human subjects performing various missions inside space simulation chambers.

Physiological information in the form of electrical voltages is transmitted from the subjects to the system which samples them at speeds to 15 thousand samples per second. The data is then transcribed onto magnetic tape for processing by digital computers.

In other areas of the Manned Spacecraft Center, Beckman PCM ground telemetry systems serve in data reduction facilities used to process information from major NASA programs. At

these facilities, data tapes containing information from space flights and ground tests are reduced, refined and prepared for analysis by digital computers.

Another method of successful mission planning at the Manned Spacecraft Center—of charting a successful path to the unknown—is the use of simulation techniques made possible by a new hybrid, analog-digital computer system built in a cooperative effort by Beckman and Scientific Data Systems, Inc., of Santa Monica, Calif.

The all solid-state system, which features Beckman analog and SDS digital computer units, will be used in the "real time" simulation of orbital trajectories and in the study of interplanetary space probes.

In the Beckman/SDS computer system, the analog com-

puter emphasizes simulation capabilities, with the digital computer stressing storage, arithmetic and control capabilities. A programming system instructs the equipment in how to analyze the program and determines which part can be solved with analog or digital techniques.

Other Beckman instruments and components are utilized in scientific programs conducted at a number of the Manned Spacecraft Center's laboratories and field facilities. The company's analytical instruments—spectrophotometers, gas chromatographs and other analyzers—are used for the analysis and identification of liquids, chemicals and gases in scientific programs ranging from the simulated flight testing of metals to the development of the actual food the astronauts will eat during future missions.

Beckman counting and timing instruments are utilized in various MSC electronics laboratories, and precision components—potentiometers, delay lines and related items—are used in control systems and other installations.

In addition to its aerospace and defense activities, which account for about 25 per cent of total sales, Beckman is a leading manufacturer of commercial instrumentation with applications in science, industry, medicine, agriculture, education and air and water pollution monitoring and control.

Now observing its 30th anniversary, the company is a worldwide organization with more than 6,000 employees. Company headquarters, and four operating divisions are located at Fullerton, Calif., 25 miles east of Los Angeles. Other major divisions are at Palo Alto and Richmond, in the San Francisco area, and Chicago.



SPACE EXPERIMENT—Dr. Robert Gafford, project manager, shows Cardiovascular Reflex Conditioning System, which will be used aboard Gemini in an experiment to determine if blood circulation of the lower limbs can be stimulated artificially during weightlessness.



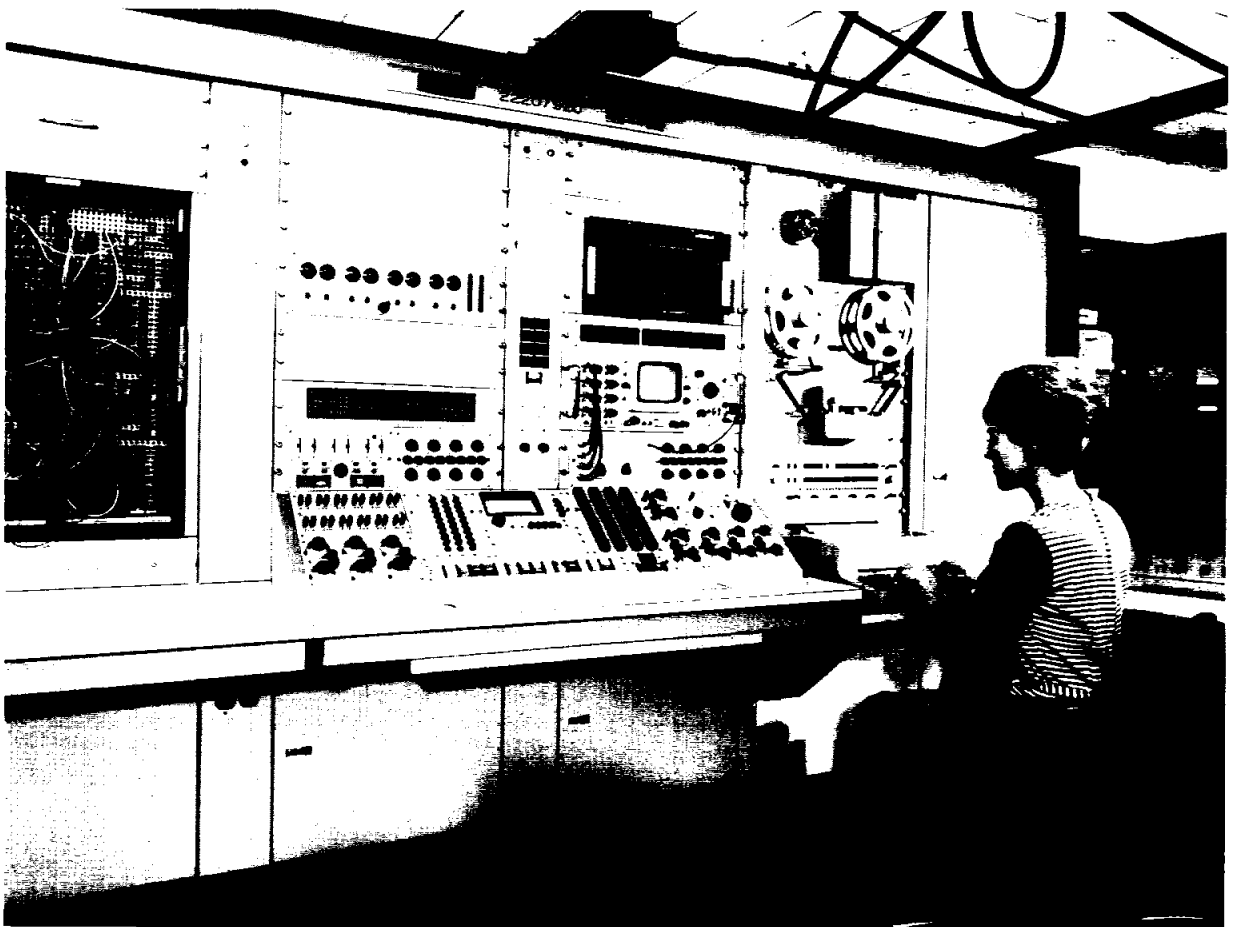
LABORATORY ANALYZER—This Beckman infrared spectrophotometer, shown here at company's Scientific and Process Instruments Division headquarters, Fullerton, Calif., is of the type for chemical analysis in scientific laboratories.



FLIGHT CHECKUP—Charles Kayser, project engineer, holds tiny electroencephalograph electrodes and signal conditioner to be used aboard Gemini to monitor brain waves of the astronauts.



REMOTE STETHOSCOPE—Electronics Engineer William Birnbaum tests on himself new Phonocardiogram System scheduled to monitor the heart sounds of the Gemini astronauts.



HYBRID COMPUTER—New Beckman/SDS Integrated Computer System, built by Beckman's Computer Operations, Richmond, Calif., will be used in simulation programs of Gemini and Apollo series.

The SPACE NEWS ROUNDUP, an official publication of the Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas, is published for MSC personnel by the Public Affairs Office.

Director Robert R. Gilruth
Public Affairs Officer Paul Haney
Editor Milton E. Reim
Staff Photographer A. "Pat" Patnesky

On The Lighter Side



Post Apollo Flight Applicants?

Two possible aspiring young applicants for post Apollo flights dropped by the Manned Spacecraft Center recently to meet some of the people working in the space program.

Maybe their aspirations are not inclined toward space travel as yet, but who knows what some of today's youngsters may aspire to do. Anyway they make a handsome couple.

The youngsters are (l. to r.) Laurie Leigh Lackland, two months; and Christopher Hale, four months. And they do have an indirect association with the space program—their mothers, Annette B. Lackland and Joanne F. Hale, were former secretaries here at the center, until more important matters took them from their duties.

Space News Of Five Years Ago

MARCH 7-10, 1960—An indoctrination program in free-floating during weightless flight was conducted for the astronauts at the Wright Air Development Center. The rear end of a C-131B aircraft was cleared and padded. Some 90 parabolas of 12 to 15 seconds of weightlessness each were flown. The objective was to present orientation problems of floating in space with the eyes opened and closed. Also the astronauts made attempts to use tools and move weights while they were in weightless condition.

MARCH 9, 1960—Position titles for Project Mercury operational flights were issued. During the flights, 15 major positions were assigned to Mercury Control Center, 15 in the blockhouse and two at the launch pad area. The document also specified the duties and responsibilities of each position.

MARCH 11, 1960—Pioneer V, launched as a probe of the space between Earth and Venus, began to provide invaluable information on solar flare effects, particle energies and distributions and magnetic phenomena. Pioneer V continued to transmit such data until June 26, 1960, when at a distance of 22.5 million miles from earth, it established a new communications record.

MARCH 15, 1960—The Saturn project was officially transferred to NASA from the Army Ballistic Missile Agency.

—George C. Marshall Space Flight Center at Huntsville, Ala., was named by executive order of the President.

MARCH 16, 1960—The Space Task Group published recovery requirements for the Mercury Atlas 1 (MA-1) flight test.

MSC Employees Urged To Utilize Services Of KSC Liaison Office

In conjunction with the recent reorganization within NASA at Cape Kennedy, a Kennedy Space Center Liaison Office has been established here at the Manned Spacecraft Center.

The office will aid in the exchange of information between KSC and MSC. Requests from MSC people for aid, service, or information from KSC, will be received for quick response by the liaison office.

Staffing the Houston office to serve MSC people, are Philip R. Maloney and M. Rebecca Kinard. They worked at the Cape as part of the former MSC Florida Operations group, and

Welcome Aboard

Twenty-eight persons joined the Manned Spacecraft Center during the last reporting period.

Center Medical Programs Office: William R. Carpentier.
Office Services Division: Helen V. Shea.

Flight Crew Support Division: Jackie W. Bohannon, Mary B. St. Amant, and Charles L. Stough.

Crew Systems Division: David L. Ewing.

Computation and Analysis Division: Heibert G. Epps, and Carol G. Scott.

Flight Control Division: Bobby G. Brothers, and Maurice G. Kennedy.

Landing and Recovery Division: Larry R. Bell, Matthew Rauloul Soulant, and Fredric C. Sponholz.

Mission Planning and Analysis Division: Mary T. Alexander, William J. Bennett, Harold L. Conway, Stanley D. Holzaepfel, and Jacob C. Richardson.

Florida Operations (Cape Kennedy, Fla.): Paul J. Graf, John E. Malone, Howard E. Baxter, Charles A. McEachern, Anthony J. Miadich, Donald E. Peairs, and David Steele.

Apollo Spacecraft Program Office: Kenneth L. Nelson.

SPACE QUOTES

REQUIREMENTS PLACED ON SELECTION AND DEVELOPMENT OF NEW TECHNOLOGY. Dr. Raymond L. Bisplinghoff, associate administrator, Office of Advanced Research and Technology, Atomic Industrial Forum, 1964 Annual Conference, San Francisco, Calif. Dec. 2, 1964.

"The nation's aeronautics and space programs are replete with examples where today's missions are made possible because new technologies were pioneered years ago before requirements for such missions were conceived, and indeed in many cases before a

program of space exploration was undertaken. One such example relates to the creation in the 1950's of a technology for employing hydrogen as a fuel for aircraft and rockets. This work, which culminated in the operation of a regeneratively cooled hydrogen-oxygen rocket thrust chamber in 1957, only a month after the first Sputnik was launched, served as a basis for our commitment to the use of hydrogen-oxygen rocket systems in the upper stages of our advanced vehicles from Centaur through Saturn . . ."

by virtue of their familiarity with Cape activities, are well prepared to aid MSC people. The office is located in Building 2, room 859, and their extension is 5234. Proper use of this liaison office can directly contribute to the effectiveness and economy of our operation here at MSC, Wesley L. Hjernevik, assistant director for Administration stated. Unnecessary travel to KSC can at times be avoided. In many cases, use of this office can secure a quick response which would not be possible through correspondence or use of a TWX.

MSC PERSONALITY

Gemini Budgets, Costs, Schedules, Responsibility Of Richard Henry

Controlling the budgets, costs and schedules of the Gemini Program and insuring coordination of Gemini Program Office activities, is the responsibility of Richard C. Henry, Gemini Program Control Manager.

Henry, a lieutenant colonel in the U. S. Air Force, assigned to NASA, joined the space program in February 1962 as Apollo Guidance and Navigation officer in the Office of Manned Space Flight, NASA Hq. In July 1963 he became chief of Lunar Excursion Module Guidance and Navigation Development OMSF; and in December 1963 he assumed duties as director of Gemini Program Control, OMSF.

He joined the Manned Spacecraft Center and assumed his present duties as Gemini Program Control manager in May 1964.

The budgets for the Gemini spacecraft, launch vehicle, and target vehicle are controlled by Henry, along with the responsibility for reporting schedules and status of the Gemini program.

Henry serves as the primary interface between the Gemini Program Office and the Gemini contracting officer. He is also responsible for integrating the NASA and Department of Defense experiments into the Gemini program, as well as coordinating the activities pertinent to mission evaluation and spacecraft acceptance reviews.

In exercising his assigned function, Henry supervises, in conjunction with his deputy, three organizational offices: Program Integration, Spacecraft Program Control, and Vehicles Program Control.

Henry was born in Streator, Ill., and completed his early schooling there. In 1949 he was graduated from the U. S. Military Academy at West Point with a BS degree in military engineering. In 1954 he was awarded masters degrees in

aeronautical engineering and in instrumentation engineering from the University of Michigan. From 1954 to 1958 he was with the Strategic Air Command in the field of tactical requirements and operational planning. As a tactical requirements officer, he

was stationed at Holloman AFB, N. M., where he assisted with the integration of the Rascal, Atlas, Titan and Thor weapons systems into SAC.

After completing this assignment, he spent nearly two years in Europe developing war plans and combat operating procedures on the Thor missile, and negotiating agreements on the missile, between the USAF and the Royal Air Force. He also worked during this period with the Italian Air Force in the transfer of the Jupiter missile from the USAF to their operation.



RICHARD C. HENRY

His first direct association with the space program was with the Director of Operational Requirements, USAF Hq. from 1960-62 defining military space systems developments and requirements.

Henry has authored and presented several technical papers. They include The Military Mission in Space for the Air University Quarterly Review; Manned Space Flight Navigation Techniques, presented before the Institute of Navigation, the Royal Geographical Society, London, England; U. S. Manned Space Flight Program, presented to the International Space Congress in Milan, Italy; and Manned Space Flight Navigation, presented to the Air and Space Navigation Congress in West Berlin, Germany.

He is a holder of the Air Force Commendation Medal with Oak Leaf Cluster and is a senior pilot with over 3000 hours in propeller and jet aircraft.

Henry is married to the former Cheryl D. Barton of Cedar Rapids, Iowa, and the couple has three children: Nanette 14, Bart 12, and Pamela 17 months. The family resides in Nassau Bay.

As for sports, Henry said he enjoys a game of handball, squash or tennis when time permits.

Gemini

(Continued from Page 1)

and John W. Young the prime crew for the mission, will be controlling the spacecraft as it makes these maneuvers in space.

Another significant first will also take place on the GT-3 flight. It will carry the first operable computer into space.

The backup crew for the GT-3 flight is Walter M. Schirra Jr. and Thomas W. Stafford.

LEM Tests Conducted On Air-Bearing Supported Table

Using a three-axis spacecraft motion simulator, the Control Systems Development Branch, Guidance and Control Division, is preparing to dynamically test the LEM Stabilization and Control System (SCS) using an engineering model of the SCS, designed and fabricated in-house.

The simulator is essentially an air-bearing supported table which consists of a ten-inch spherical bearing mounted in a cup into which air is continuously forced from the bottom at sufficient pressure to lift the ball and its load one-to three-thousandths of an inch on a film of air. The ball and its load are then free to rotate in three axes.

Technical Services Division originally constructed the air-bearing table at Langley Field in Virginia.

A six-foot diameter "table" on the ball provides the working area. Such a system is practically frictionless and reacts to applied forces as if it were undergoing free fall in a vacuum, making it an ideal tool on which to study control systems.

The unique feature of the system under test, is that a LEM descent engine motion simulator, which was designed and built in-house, will be used to change the balance of the motion simulator to represent the gimbaling of the LEM descent engine. The unit employs a weight mobilized by drive motors and screwjacks to simulate the gimbaling of the descent engine.

In addition, the proposed testing will provide valuable experience for more elaborate testing of vendor-supplied Apollo stabilization and control systems on a 13-foot precision three-axis spacecraft motion simulator which is due for

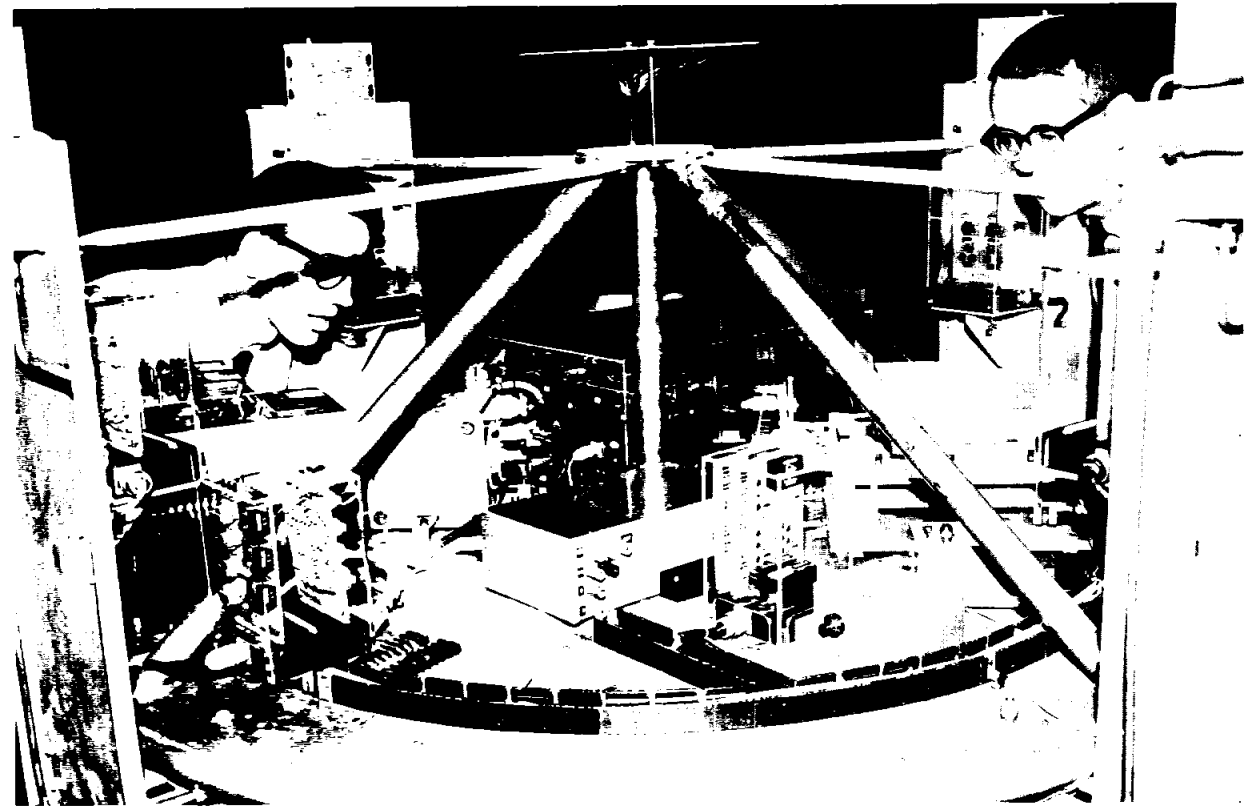
delivery early in 1966.

During powered descent of the LEM, the SCS conditions the pitch and roll steering error signals, so that the thrust vector of the descent engine is aligned with the vehicle's center of gravity. This action reduces the work load on the reaction control system in maintaining the desired attitude of the spacecraft.

Problems associated with the SCS have been examined in a number of analog and digital computer studies. These simulations have investigated LEM stabilization using idealized hardware characteristics, neglecting such nonlinear parameters as thruster dynamics, rate sensor dynamics, noise, and system tolerances. The incorporation of hardware in conjunction with the motion simulator will allow dynamic testing to determine performance characteristics with these parameters present.

The hardware includes the attitude and translational control assembly (ATCA), Descent Engine trim gimbal stabilizing electronics, attitude and rate gyros, a simulated hypergolic RCS, and a simulated thrust vector and descent engine gimbaling system.

This hardware with the exception of the gyros and RCS thrusters was designed and fabricated in-house to operationally duplicate the functions of the proposed hardware.



PREPARING FOR SIMULATION—J. T. Edge, (left) Control Electronics Section, Control Systems Development Branch, and Bill McMahon, Electro-Mechanical Systems Section, CSD Branch, Guidance and Control Division, make some checks of the hardware on top of the air-bearing table preparatory to making a test run with the spacecraft motion simulator.

Astronauts Study Nevada Volcanic Geology And Craters Created By Nuclear Explosions

Craters in surface depressions created by nuclear explosions and the volcanic geology of a portion of Southern Nevada are being studied by United States astronauts as they continue their series of geological field trips.

The studies are being conducted at the Atomic Energy Commission's Nevada Test Site and began Tuesday, February 16. The test site contains a number of craters created by nuclear and chemical high explosive blasts. The nuclear explosion

sites now have very low levels of radioactivity. The craters resemble meteoritic impact craters that may be found on the moon.

On the test site also are calderas, or crater areas from ancient volcanic activity, which also may be found on the moon surface. The astronauts will study both explosive and volcanic craters during their visits to Nevada.

Three trips to the test site are scheduled about a week apart. The first was in Yucca Flats,

where nuclear explosive tests have been conducted since the early 1950's. The astronauts inspected a number of explosion produced craters, including the large Sedan Crater created in a 1962 experiment in the Plowshare Program to develop peaceful uses for nuclear explosives.

Small dynamite blasts were set off in a forward area of the test site Tuesday afternoon. Using seismic equipment, the astronauts practiced geophysical observations and attempted to locate a buried ridge in the area.

Air Force helicopters were used on the second day of each trip to cover a wide area of rough Nevada desert country near the western edge of the test site. The field trip members made stops at several calderas to study the geology of these ancient volcanic formations.

On the final day, the astronauts are scheduled to visit the nuclear rocket development station at the southwest corner of the test site, where testing is performed on nuclear reactors for future space nuclear engine development.

Lectures

(Continued from Page 1)

Center management.

Dr. Jastrow who was one of the recent winners of the Arthur S. Flemming Award for outstanding young men in government, is a theoretical physicist who has taught at Columbia and Yale Universities.

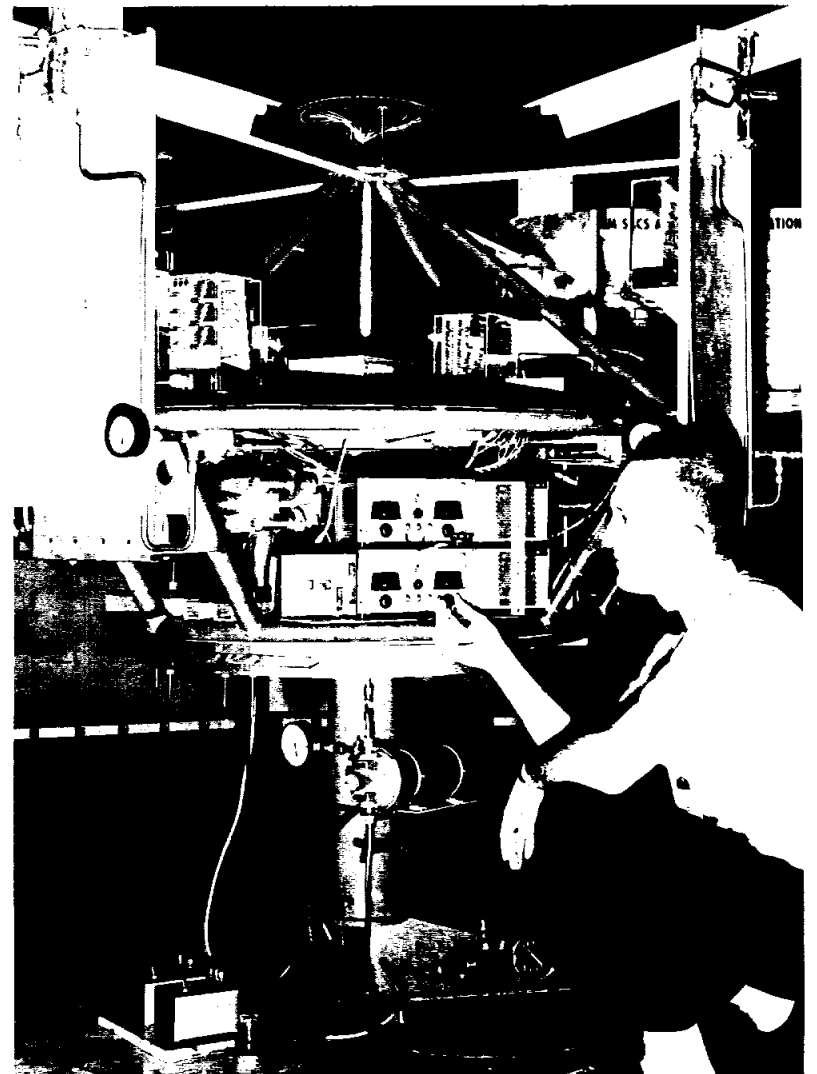
In addition to his duties as director of the Goddard Institute for Space Studies, he is also adjunct professor of geophysics at Columbia University.

Dr. Jastrow is recognized as one of the nation's foremost experts in the field of geophysics, and his ability to speak in terms easily understood by all is one of his greatest talents.

Carpenter Has Surgery



RECUPERATING—Astronaut M. Scott Carpenter is shown recuperating from surgery that removed a bony spur from his left wrist and a pin from the toe of his right foot. The surgery, performed at Houston's Methodist Hospital, was connected with the motor bike accident Carpenter had in Bermuda. He has since returned to his job as special assistant to the director of MSC. He is scheduled to return to the U. S. Navy Sea Lab program around the first part of April.



ADJUSTMENTS—Davis R. Dalby, electronic development technician, Electro-Mechanical Systems Section of the Control Systems Development Branch, Guidance and Control Division, makes an adjustment on the air-bearing supported simulator.

Space News **ROUNDUP!**
SECOND FRONT PAGE



FINAL ADJUSTMENTS—Astronaut Virgil I. "Gus" Grissom, command pilot for the first manned Gemini spaceflight, gets help in adjusting a pressure suit glove from a suit technician prior to entering a Gemini spacecraft for egress training in the Gulf of Mexico. Standing at left is Astronaut John W. Young, pilot for the mission.

Dr. Shea Names Dr. Wm. Lee Assistant Manager Of Apollo

Dr. Joseph F. Shea, manager of the Apollo Spacecraft Program Office, has named Dr. William A. Lee as assistant program manager.

Lee, formerly head of the Operations Planning Division under Shea, joins Dr. Harry L. Reynolds who was appointed last week as an assistant program manager.

Lee's former division has been merged with the Systems Engineering Division under Owen E. Maynard. Branches of the former Operations Planning Division will remain intact.

Dr. Lee's primary area of responsibility will be the operational aspects of the Apollo program for both the nominal lunar mission and the flight

test program.

Dr. Reynolds will be primarily concerned with development of the Lunar Excursion Module, the portion of the Apollo spacecraft destined to land two Americans on the moon.

Robert O. Piland, deputy manager of ASPO, will continue to be involved primarily with command and service module development, and with overall program management with Dr. Shea.

Before joining Manned Spacecraft Center in December, 1963, Dr. Lee was director of Advanced Studies for the Office of Manned Space Flight at NASA Headquarters. Dr. Reynolds recently joined NASA from the Lawrence Radiation Laboratory in California where he was director of the Nuclear Ramjet Division.



DR. WILLIAM A. LEE

Gemini S/C 3-A Makes 126 Orbits In Test Simulation

Gemini spacecraft 3-A has just completed a test run of 126 and one-half continuous orbits in the altitude chamber at McDonnell Aircraft in St. Louis, Mo.

Object of the test was to evaluate the orbital thermal control system for long duration missions as well as overall systems operations for long duration flights.

The test, performed at a simulated altitude of 424,000 feet, showed no big problems, and the spacecraft radiator performed well.

Grissom And Young

GT-3 Prime Crew Train At Sea

Except for the braided nylon tethering line running back through the water to the ship, the Gemini spacecraft riding the swells in the Gulf of Mexico last week could have been a spacecraft just returned from an orbital flight.

The spacecraft was real, the flight crew aboard was real and the Gemini pressure suits they wore were real; the only artificial thing was the fact that the spacecraft and its crew had been launched into the Gulf by a crane aboard the NASA Motor Vessel Retriever instead of by a Gemini Launch Vehicle.

Realism is the byword when it comes to egress training for the Gemini flight crews. GT-3 prime crew Virgil I. "Gus" Grissom, command pilot, and John W. Young, pilot, learned first hand how realistic the training could be last week as the Gemini Spacecraft Static Article Five pitched and rolled in the six-foot waves of the Gulf. Following a half hour of post-landing cockpit checks with the hatches buttoned up, Grissom and Young practiced emergency egress procedures developed by the flight crew training staff for Gemini.

Both pilots exited through the left, or command pilot's hatch, after first heaving their survival kits into the water. Following the survival kits into the water, each astronaut practiced boarding a Gemini one-man life raft. Standing by in a large raft were swimmers Lamarr Beatty and Art Lizza of Field Test Branch, Technical Services, and Jerry Flanagan of Instrumentation and Electronics Systems Division.

Enroute to the training site in the Gulf 15 miles south of Galveston, the flight crew was

Space Council Representative To Address AIAA

Dr. Charles S. Sheldon II, of the National Aeronautics and Space Council, will address the March 8 meeting of the American Institute of Aeronautics and Astronautics (AIAA).

His subject will be "Space Leadership: Goals and Performance (USSR and the United States)".

Dr. Sheldon has been on the President's space council since 1961. From 1958 to 1961, he was technical director of the House Science and Astronautics Committee and participated in the act that created NASA.

The meeting will be held in the Crest Hotel on FM 528, with the program beginning at 7:30 p.m. Preceding the program will be a social hour and dinner, at 5:30 and 6:30 respectively.

Reservations for the social hour and dinner may be made by calling Goldie Marks, Ext. 2283, or Pat Todsden, MI 9-2733.

Those desiring to attend only the program portion may come at 7:30 p.m. and need not make reservations.

briefed on post-landing procedures by Gordon Harvey Spacecraft Operations Branch of Flight Crew Support Division; Peter Armitage, chief, Operational Evaluation and Test Branch, Landing and Recovery Division and Harold Granger, Recovery Operations, Landing and Recovery Division.

Dr. Clarence A. Jernigan, Center Medical Office, was the medical monitor for the training exercise.

Operating the Retriever's crane and rigging the Gemini spacecraft for lowering into the water and retrieval, were Lyman Lee and Bill Johnson, both of Field Test Branch of Technical Services Division.

The 115-foot Motor Vessel Retriever, a converted LCU (Landing Craft-Utility) is skippered by Frank Gammon of Operational Evaluation and Test Branch, Landing and Recovery Division.



EGRESS INTO GULF—Both flight crew members egress through the left, or command pilot's hatch, into the Gulf of Mexico. Command Pilot Virgil I. "Gus" Grissom and Pilot John W. Young received specialized training in egress from the Gemini spacecraft. They are the prime crew for the forthcoming first manned Gemini spaceflight.



AFTER THE EXERCISE—The GT-3 prime crew, Astronauts Virgil I. Grissom and John W. Young, and divers Lamarr Beatty, Art Lizza, and Jerry Flanagan, are shown in a large life raft as they prepare to board the Retriever, after the training exercise in the Gulf had been completed.

Dr. Gilruth Serving As Co-Chairman Cancer Crusade's Government Division

Dr. Robert R. Gilruth, director, Manned Spacecraft Center, and Philip T. Hamburger, assistant for Congressional relations have joined the American Cancer Society Crusade in Harris County in top volunteer positions of leadership.

Volunteers from government will be joined by volunteers from the professions, business and industry in the Crusade to save more lives from cancer through research, education and service.

Dr. Gilruth will act as co-chairman of the Public Service and Government Divisions of the Crusade which is chaired by Granville Elder, Houston postmaster.

The 1965 Crusade will em-

phasize a "Tell Your Neighbor" theme, the major goal to bring to the attention of the public the importance of prompt diagnosis and treatment of cancer. The second goal is to raise money for more research, education and service. Goal for Harris County is \$245,000.

According to the American Cancer Society, 92,000 men and women will die of cancer this year because they did not get to their doctors in time for early diagnosis and prompt treatment.

A kick-off breakfast at the Rice Hotel, March 10, will launch seven Crusade divisions, including Public Service and Government.