

Orbiter V Scuttled As Gas Runs Low

The Lunar Orbiter project ended early January 31 as spacecraft controllers sent Lunar Orbiter V, last of the series, crashing into the face of the Moon.

Lunar Orbiter V had been circling the Moon since August 5, 1967. It became necessary to destroy it because its supply of attitude control gas was nearly depleted.

IEEE Meeting Features Space Computer Talk

The application of present spacecraft and launch vehicle computers in vehicles such as Centaur and manned orbital workshops will be discussed at a February joint meeting of the Aerospace and Electronics Systems and the Computer Technology Groups of the Houston Chapter of the Institute of Electrical and Electronic Engineers.

The meeting will be held February 19 at the Holiday Inn, NASA Road 1, with a social hour beginning at 6 pm, dinner at 7 pm, and the program at 8 pm.

Glenn C. Randa, Manager of the Space Systems Development Group, IBM Space Systems Center, Rockville, Maryland, will be the principal speaker.



In his talk on "Computers in Spacecraft Systems," the functions which computers will perform and the characteristics of the hardware necessary will be enumerated. Future requirements in space stations and other missions will be projected, including the particularly significant problems of reliability, power and data management.

Randa will also discuss the technology which is expected to be available to meet these requirements, including large scale integration and advanced memory technology. Redundancy techniques applicable to long missions will be presented and evaluated, making use of anticipated component part failure rates.

Problem areas not yet resolved in the applicant of next generation technology will be examined, including packaging and cooling, lower power, logic partitioning, discretionary wiring and proliferation of part numbers.

Ralph S. Sawyer, Chief of the MSC Instrumentation and Electronics Systems Division, and Walter Orvedahl, Director of Computer Systems Department, Rice University, will preside at the meeting.

Non-members and prospective members of the Houston IEEE Chapter are welcome. Reservations or information requests should be made to Dianne Milner, HU 3-5541.

In its photographic lifetime last August, the spacecraft photographed and transmitted to Earth 212 telephoto and 212 wide-angle pictures of the lunar surface. It concentrated on 36 areas of particular interest to scientists on the Moon's face, and completed coverage necessary for a full-photographic survey of the Moon's hidden side.

Since that time, Lunar Orbiter V was used to provide a tracking target for stations of the Manned Space Flight Network, allowing those stations to train their crews with an active spacecraft in lunar orbit and to verify computer programs intended for use in lunar navigation for project Apollo.

Final operation in scuttling Orbiter V consisted of an 18.9 second burn of the velocity control engine when Lunar Orbiter V was near the apolune or high point of its orbit, about 1,260 miles above the lunar surface.

The engine thrust decreased the spacecraft's speed by about 64 miles per hour, and as it approached low point of orbit, it was no longer able to overcome the Moon's gravity.

Impact occurred at 1:58.5 am CST near the equator on the Moon's western limb.

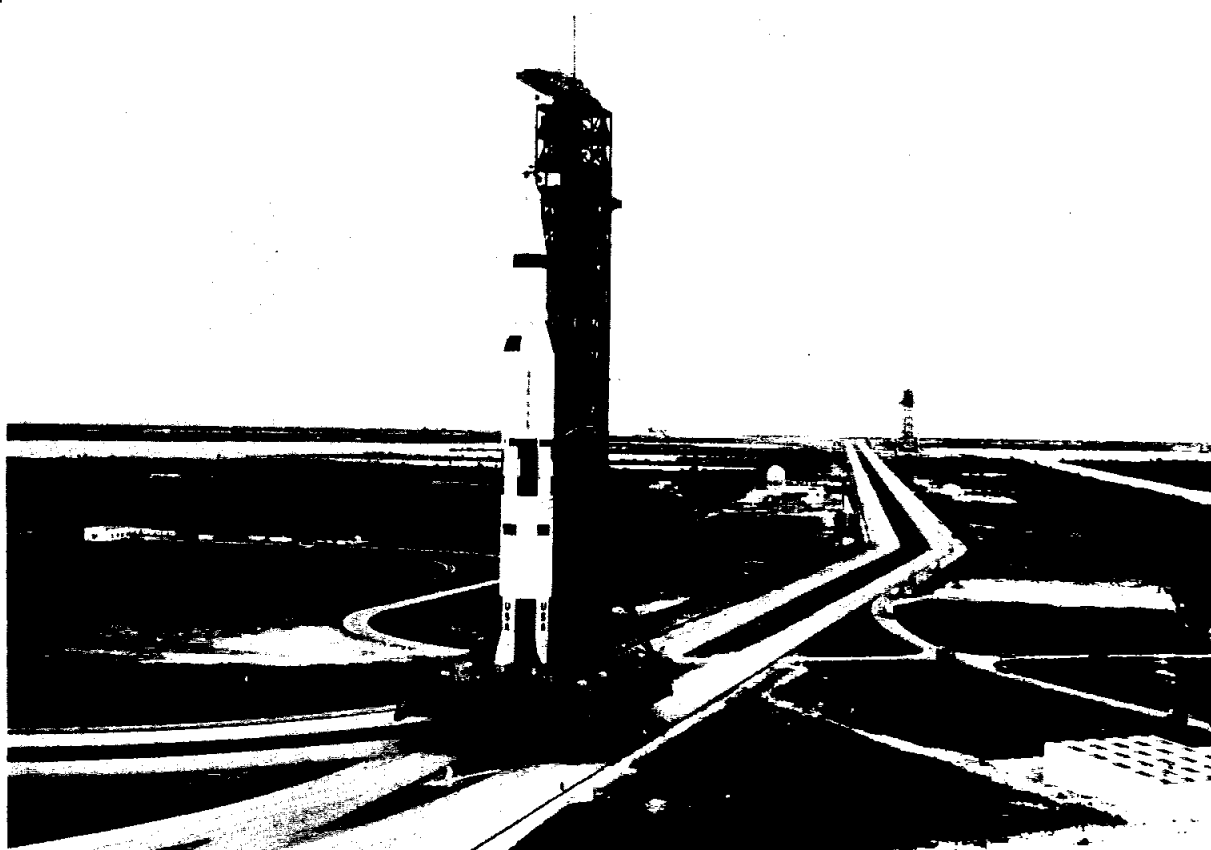
At the time of the final engine burn, Lunar Orbiter V was in its 1,200th circuit of the Moon. The last previous use of the engine was October 10, 1967, when a slight orbit adjustment was made to help the spacecraft through an eclipse of the Moon. The engine on Lunar Orbiter V was used six times in all, and the last firing was the 29th successive precise burn in the Orbiter program.

Three previous Lunar Orbiters were deliberately crashed as their control gas ran low. Lunar Orbiter IV was not commanded to crash. It went out of contact with Earth last summer. Calculations from final tracking data indicate it decayed through natural causes and hit the Moon in the Autumn.

The Lunar Orbiter program began with the first launch from

(Continued on page 8)

Slowest Three Miles

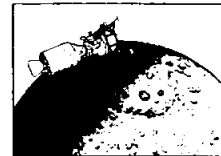


ROLLOUT—The second Saturn V launch vehicle and Apollo Spacecraft 020 charge at a snail's pace down the crawlerway between the KSC Vehicle Assembly Building and Launch Complex 39. The stack will be flown as Apollo VI in the second test of Saturn V first and second stages. The command module will come smoking back into the atmosphere in excess of lunar return velocity in a test of its heatshield, and the S-IVB third stage will continue into an extreme elliptical orbit with an apogee at approximately lunar distance. The 3.5-mile trip to the pad February 6 took about eight hours.

ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



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Apollo VI Moves to Pad 39, Begins Preflight Checkouts

The Apollo VI launch vehicle/spacecraft stack February 6 made the three-and-a-half mile trek across the crawlerway from the KSC Vehicle Assembly Building to Pad A of Launch Complex 39, where the Saturn V stages immediately underwent checkouts. Checkouts of Apollo spacecraft 020 were scheduled to begin next week.

The Apollo VI stack and its Launch umbilical tower left the

VAB at 10:44 am CST and arrived at the pad some eight hours later. Apollo VI will be the second flight test of the Saturn V first and second stages and the second qualification test of the command module heatshield at entry velocities in excess of lunar return speed.

Apollo VI flight controllers were scheduled yesterday to take part in a 10-hour in-house network simulation in Mission Control Center.

In developmental testing in support of unmanned and manned Apollo flights, a manned vibro-acoustic test was run February 10 in the Bldg 49 Vibration and Acoustic Test Facility with pilot L. Gordon Cooper aboard Apollo spacecraft 105. The test was one of series of low-frequency tests which began February 5.

The manned test was scheduled into the unmanned vibro-acoustic test program to determine if crewmen would experience visual problems in Saturn V launch vehicle low-frequency vibrations.

Cooper made two test runs totaling 2 min 40 sec during which he carried out a number of tasks. He reported in post-test debriefing that he had experienced no problems during the test runs.

Apollo command and service modules 105 are undergoing vibro-acoustic testing to verify vehicle plumbing and wiring

interconnects to be used in the first manned Apollo mission.

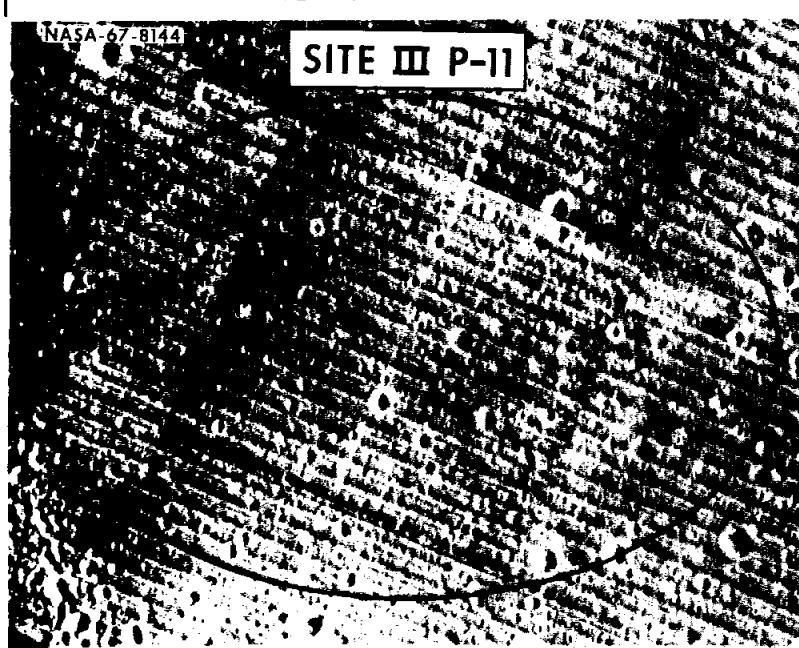
Fit-and-function tests last week were run on Lunar Module Test Article-8 (LTA-8) ingress/egress and crew compartment in preparation for LTA-8 thermal-vacuum testing in the Space Environment Simulation Laboratory's Chamber B. Procedural dry-runs will be made next week, followed by manned tests of the Chamber B facility environmental control system. Upon completion of the ECS tests, Chamber B's dome will be reinstalled and first man-rating checkouts will begin early in March.

Go-Texan Day Set Wednesday

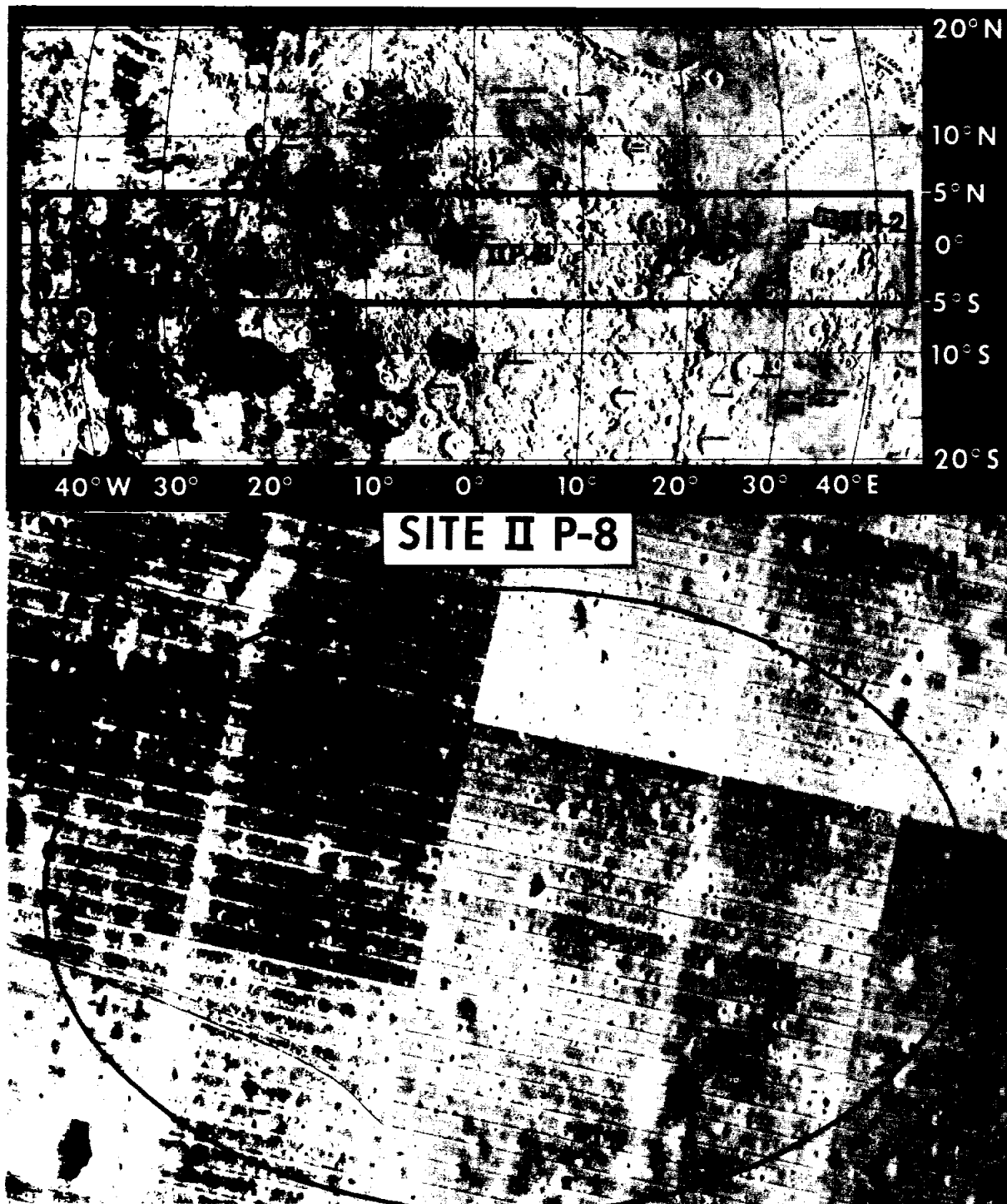
Stetsons, boots and string ties will be the uniform of the day next Wednesday around the old MSC corral, for it will be Go-Texan day in the MSC-Clear Lake area. Everyone is urged to dust off his drugstore-cowboy duds and wear them to work that day.

A special 3000-seat section has been set aside for MSC-Clear Lake area people at the February 25 performance of the Houston Livestock Show rodeo. Tickets at \$2 each are available from EAA representatives or from John or Betsy Bednarcyk at MSC Ext 4588, 591-3300 Ext 3233, or 591-4184.

Lunar Whatsit



PUZZLEMENT—Several Lunar Orbiter photos with oval outlines superimposed on them were released last week by NASA. Could they be possible sites for a stadium on the moon? Or perhaps proposed locations of racetracks? For the real story on what these ovals mean, turn to page 2.



LANDING PATTERN—The first Apollo lunar landing crew likely will touch down in the Lunar Module in one of the five rectangles shown in the top photo. The five sites were picked by the NASA Apollo Site Selection Board from among 30 sites originally under consideration. The lower Lunar Orbiter photo shows Site 3 (II P-8) near the exact center of the Moon's visible face in Sinus Medii.

A. J. Calio Appointed S&AD Project Deputy

Anthony J. Calio, of the Office of Space Science and Applications, NASA Headquarters, has been named Deputy Director for Projects for the MSC Science and Applications Directorate.

Calio, 38, has been Assistant Director for Planetary Explorations with the Office of Space Science and Applications, NASA Headquarters. As Deputy Director for Science and Applications Division, he will share the technical and managerial responsibility for the Science and Applications Directorate with Dr. Wilmot N. Hess, S&AD Director.

Calio joined NASA in 1963, as a member of the Electronic Research Task Group where he assisted in the development of scientific objectives for the new Electronic Research Center, Cambridge, Massachusetts.

In his new post, Calio will assist in directing seven major offices and divisions within the Science Directorate, which plans and implements MSC programs in space science and applications.

Calio is a graduate of the University of Pennsylvania, where he received his BA in Physics in 1953. Prior to joining the NASA

in 1963, he was with the Bettis Atomic Power Division of Westinghouse Electric Corp. (1956-59); Manager of the Nuclear Physics Section of the American Machine and Foundry Co., Alexandria, Virginia (1959-61); and Executive Vice-President and Manager of Operations for the Mount Vernon Research Center, Alexandria, Virginia (1961-63).

Calio's appointment was effective February 11.

Sea-Arama Tickets Sold at Discount

March is MSC month at Sea-Arama Marineworld in Galveston. Tickets reduced to \$1 each are available from EAA representatives and from contractor recreation coordinators. The discount tickets will *not* be available at Sea-Arama. Children under five are admitted free.

New cast members at Sea-Arama are pilot whales and Humboldt penguins. Sea-Arama is open daily from 10 am to dusk, and shows are continuous. Food is available at the Pirate's Nook snack bar.

Crewmen See Mockup Of Orbital Workshop

A five-day orbital workshop crew station review is underway this week at NASA Marshall Space Flight Center, Huntsville, Ala. In this step in the design of the workshop, crewmen will walk through many of the tasks they would be required to do in orbit using an updated engineering mockup of the orbital workshop.

Taking part in the review are MSC pilots Gordon Cooper, Bruce McCandless, Stuart Roosa, Jack Lousma and Edward Gibson.

MSFC is responsible for development of the spent-stage S-IVB orbital workshop for Apollo Applications Program missions. In operation, the S-IVB orbital workshop will be purged of residual propellants and made habitable for periods up to 56 days in earth orbit. An airlock and a multiple docking adapter are also under development which would permit crew transfer from a standard Apollo command module into the orbital workshop.

Five Sites Selected For Lunar Landing

The first Americans on the moon will land in one of five 3 x 5 mile landing areas selected by the NASA Apollo Site Selection Board. Each of the five landing areas satisfies criteria in which lunar crew safety is the paramount consideration.

The places selected are ellipses around the following central points on the face of the moon:

- Site One—34°D by 2°40'N.
- Site Two—23°37' E by 0°45' N.
- Site Three—1°20' W by 0°25' N.
- Site Four—36°25' W by 3°30' S.
- Site Five—41°40' W by 1°40' N.

The first two sites are in the Sea of Tranquility, the third is in the Central Bay and the fourth and fifth are in the Ocean of Storms.

The five sites were selected from eight under study from a choice of 30 original sites. Selection of the five will permit scientists and engineers to concentrate on the fewer areas in preparing data on the specific sites.

The Board studied material obtained by unmanned Lunar Orbiters and soft-landing Surveyor spacecraft. Lunar Orbiter returned high-resolution photographs of all the sites and Surveyor provided closeup photos and surface data of the general areas in which they are located.

Following are the criteria considered by the Board:

- Smoothness of area: The sites should have relatively few craters and boulders;

- Approach paths: There should be no large hills, high cliffs or deep craters which would cause incorrect altitude signals to the landing radar;

- Propellant: The sites were selected to allow for the expenditure of the least amount of propellant by the lunar module propulsion system;

- Recycling during countdown: The sites were selected to allow for the recycling time of the Apollo/Saturn V necessary if the countdown for launch at Kennedy Space Center is delayed;

- Free-return: The sites must be within reach of the Apollo spacecraft in the "free-return" trajectory. On the free-return trajectory a spacecraft would coast around the moon and return safely to earth without requiring the operation of propulsion systems.

- Lighting: For optimum crew visibility, the sites selected will have sun-angle of from seven to 20 degrees behind the lunar module as it approaches the landing;

- Slope: The general slope of the landing area and the approach of the landing site must be less than two degrees. All sites are within the Apollo Zone of Interest—that area of the visible site of the moon within

45 degrees east and west of the center of the moon, and five degrees north and south of its equator.

The desired sun-angle range of seven to 20 degrees results in a one-day launch opportunity per month for a given site.

Since there are five landing sites selected for the first Apollo moon landing mission, there will be five days during a month on which a launch can be made.

Before flight to the moon, three of the five sites will be chosen for the specific mission. This will make a three-day period each month available for launching the prime Apollo flight.

ATS-III Revives After Camera Problem Clears

Applications Technology Satellite III (ATS-III) is again returning color and black-and-white pictures to ground stations after a lapse of several weeks.

Engineers believe the problems, possibly caused by seepage in the cameras, apparently have been cleared up.

The color camera was turned off November 29 and the black-and-white camera December 9. The latter was returned to active photographing of cloud cover December 30. The color camera has been returning pictures since the first week of January, but ground equipment designed to achieve a fine color balance in returning pictures has yet to be adjusted precisely.

Officials at the NASA Goddard Space Flight Center, Greenbelt, Md., believe that pressurized gas around a high voltage resistor in the black-and-white camera leaked, causing a corona or low pressure electrical discharge in the resistor.

They said that a corona in its high voltage system may have caused the problems with the color camera. The corona problems in both cameras are not believed related, however.

ATS-III is located at 95° WLong. It was moved from its original position of 47° WLong to permit observation of the United States during the violent storm season. It will be moved back to its original position in the spring. It is in an apparently stationary orbit over the Equator.

Of the nine major experiments carried on the 805-pound satellite, all but one, the Self-Contained Navigation System (SCNS), have been tested successfully. By ejecting baseball-sized steel balls and observing them against a star background, the SCNS can determine its own orbit and attitude. It will be tested this spring.

ATS-III was launched last November 5 from Cape Kennedy, Fla., by an Atlas-Agena launch vehicle.

Engineers Cut Apollo Flammability Through Use of 'Arson' Techniques

By Doug Ward

A third series of Apollo Command Module flammability tests began last week at MSC.

The tests were conducted in a pure oxygen atmosphere at about 16 pounds per square inch pressure, simulating one set of conditions for spacecraft ground test and pre-launch operations.

Previous command module flammability tests were conducted at MSC in December and January with cabin atmospheres simulating orbital conditions using pure oxygen at six pounds per square inch pressure and a ground test and launch pad atmosphere of mixed oxygen and nitrogen at 16 pounds pressure.

Results of the three series of tests will help determine whether pure oxygen will continue to be used in spacecraft ground test and pre-launch operations or whether a cabin atmosphere of air or some mixture of oxygen and nitrogen should be substituted to minimize fire hazards. Air or mixed gas cabin atmospheres would be gradually replaced with oxygen in orbit, where cabin pressures of five to six pounds per square inch are used as opposed to 16 pounds per square inch pressure required for operations on the ground.

Well Protected

A NASA Flammability Test Review Board headed by MSC Director Robert R. Gilruth requested the third series of command module flammability tests after receiving a report February 5 on the latest series of tests conducted with a mixed gas atmosphere of 60 per cent oxygen and 40 per cent nitrogen at 16 pounds per square inch pressure. Both the mixed gas and pure oxygen tests to date have shown the Apollo spacecraft to be generally well protected against fire, while indicating a small number of areas where additional protection is needed.

Last week's series of flammability tests followed procedures established for earlier tests. About 35 separate tests were scheduled in the pure oxygen environment at 16 pounds per square inch pressure. Fires were started intentionally, using electrical ignition techniques, near samples of every known flammable material in the spacecraft. Ignition locations were the same in most cases as for previous CM flammability tests.

Tests at the higher pressure were running predictably more severe.

Command module flammability tests are conducted in boilerplate 1224, a full scale mockup of the Apollo Command Module interior configured to represent the ground test vehicle and spacecraft for the first manned Apollo mission. The tests are being run by the Structures and Mechanics Division.

The Senior Flammability Test Review Board was established last September to determine if modifications to the Apollo spacecraft have made it sufficiently fireproof for manned tests

in space chambers and manned flights. The tests and the Board's decision constrain manned chamber tests of the CM and LM, which in turn constrain the first manned flights of these vehicles.

Two Conditions

There are two conditions for a fire within a spacecraft to be of unacceptable magnitude. First, a fire must be ignited and second, the fire must spread or propagate beyond its immediate ignition point. Both of these factors have been, and continue to be, carefully investigated from a preventive and extinguishment standpoint. However, to demonstrate that the possibility of a catastrophic fire is so remote that it can be considered negligible, at least one of the two factors must be eliminated.

Since all spacecraft wiring and other electrical equipment may be potential ignition sources, the only positive means of removing all potential electrical ignition sources is to eliminate all onboard electrical power. This, for obvious reasons, is impossible. The alternative is to demonstrate that any fire which might possibly occur will not and cannot propagate beyond the discrete region of ignition in the oxygen-rich interior environment. This was the approach selected for the validation tests of the Apollo Command and Lunar Modules.

Full scale boilerplate mockups of the CM and LM interiors were fabricated by the respective spacecraft contractors, the North American Rockwell Corporation and The Grumman Aircraft Engineering Corporation. The boilerplate vehicles simulate the flight and chamber test vehicles to a high degree of fidelity with respect to interior geometry, electrical wiring and components, flight hardware and crew equipment.

Deliberate Fires

In October and November of 1967, a program of tests was conducted on the LM in which 41 deliberate ignitions were made in the interior of the vehicle. Four materials changes were recommended as a result of the LM tests, and the vehicle was judged to be adequately fire protected.

From December 18, 1967, to January 7, 1968, flammability tests were conducted on the CM under essentially the same conditions as tests on the LM. Thirty-seven deliberate ignitions of materials in the CM were made in a pure oxygen environment pressurized to approximately six pounds per square inch, the pressure used in orbital flight. Ignition points were carefully selected to occur in the proximity of at least one sample of each of the combustible materials found inside the cabin in more than minute quantities. MSC personnel then evaluated the flammability and propagation properties of spacecraft cabin materials, contractor fire hazard fixes, crew equipment and stow-

age areas, and apparent propagation paths.

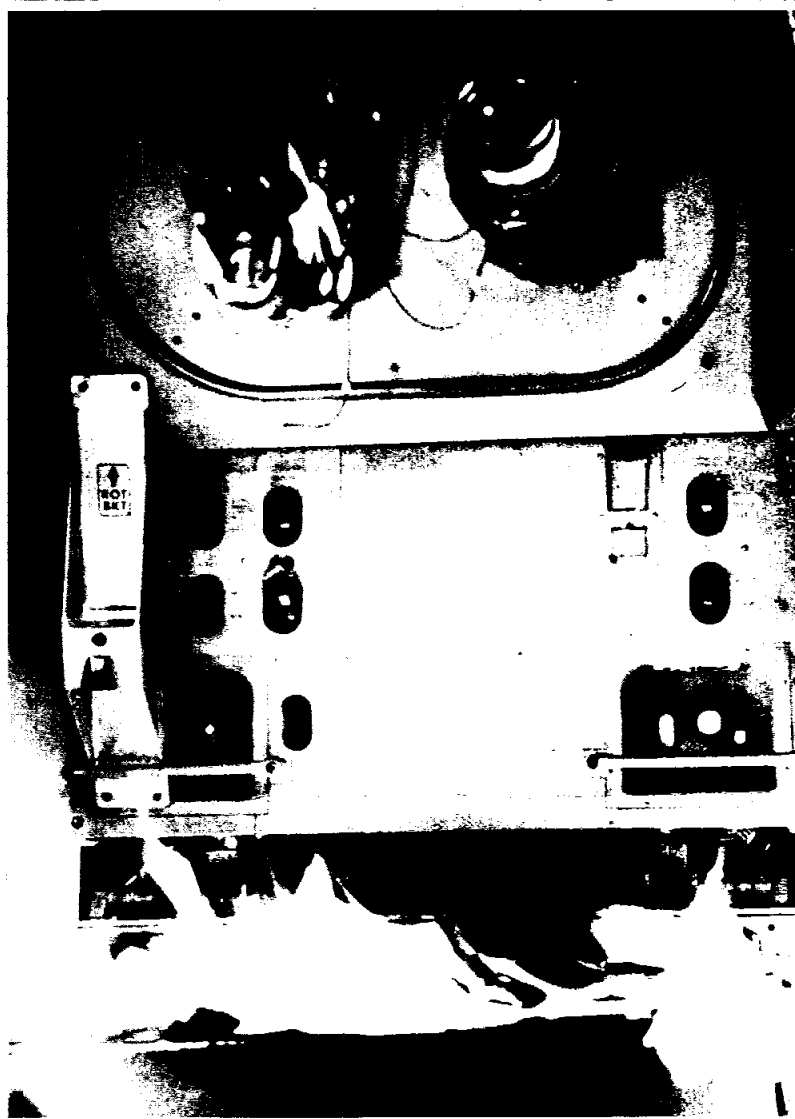
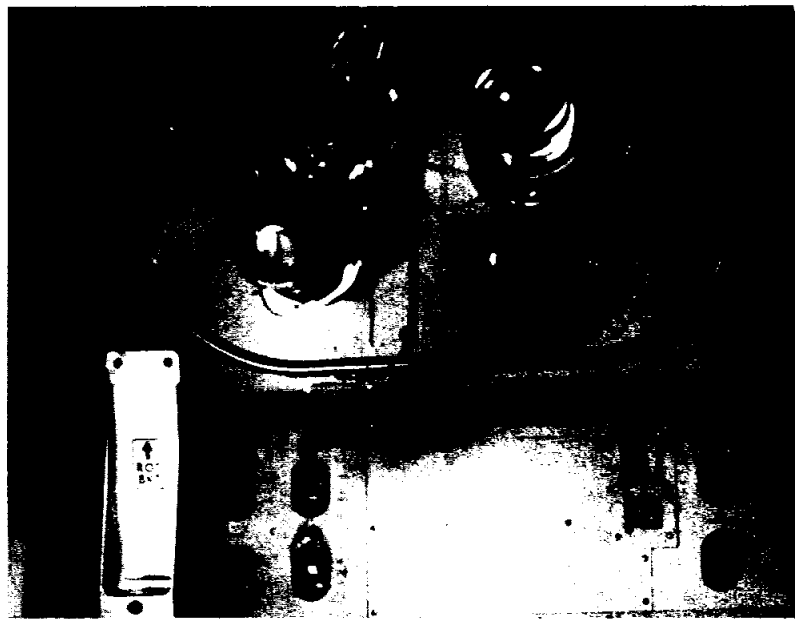
The electrical igniter is a piece of flammable silicone rubber about an inch long with a nichrome wire coiled about it. The wire coil is overloaded with an electrical current of about 11 amps at 28 volts DC, igniting the silicone rubber. The silicone rubber burns with a white-hot flame of at least 2500 degrees fahrenheit for 30 to 40 seconds. Igniters were used in virtually all of the tests rather than merely overloading spacecraft wiring, to insure that an open flame was produced adjacent to potentially flammable materials. It should be emphasized that the igniter is used to assure ignition for the test and is not a part of the spacecraft; it represents a very severe source of ignition.

The first of three typical flammability tests was conducted in the lower left-hand equipment bay under the left crew couch. An external igniter was located on the sleeve over the wiring entering the electrical connector to an electronic control unit. A clock in the upper right corner of an engineering film frame shows elapsed time from initiation of electrical power to the igniter. In this test, flame was visible from T plus 30 seconds to T plus 1 minute 53 seconds. Damage was localized to the ignition area and was limited to the wire insulation and protective sleeve. There was no flame propagation and the fire self-extinguished.

In another test example, an external igniter was located at the end of the Teflon wrap on a wire bundle. This wire bundle is located in the right hand equipment bay. The purpose of this test was to determine the flammability of the Teflon wrap on the wire bundle under the Teflon clamp sleeve and the extent of flame propagation to adjacent connectors and to adjacent wire bundles. Although Teflon is a fire resistant material, it will burn reluctantly under severe conditions. In this test, flame was observed 45 seconds after electrical overload and lasted approximately 4 minutes. The flame was localized and no significant propagation occurred. Damage was localized and minor.

The example are representative of 32 of the 37 flammability tests conducted on the CM in a near pure oxygen environment. In these 32 tests self-extinguishment occurred with only minor damage in the region of ignition. A third example test represents the worst-case flammability test for the CM and was one of five tests which produced fires of sufficient magnitude to require further consideration.

For this test an external igniter was located on fluorel material around the eyepiece of the space sextant. The purpose of the test was to determine the flammability characteristics of fluorel insulation, a spongelike material distantly related to



DELIBERATE IGNITION—One of many Apollo Command Module flammability tests is shown in the two photos above. In the upper photo, a nichrome wire/silicone rubber igniter on the guidance and navigation system sextant eyepiece has ignited a foamed fluorel protective cover after 40 seconds. Flaming fluorel particles dripped onto flight documents (lower photo) and set fire to them five seconds later. While the fire grew to an unacceptable size in about one minute, it would have been immediately visible to a crewman for prompt extinguishment. The fluorel eyepiece cover is being replaced on manned vehicles.

Teflon. The fluorel began to drip flaming particles 40 seconds after ignition, and the charts below the eyepiece ignited 5 seconds later. The test was terminated by evacuating the vehicle 1 minute 20 seconds after it began, according to pre-established ground rules to prevent unnecessary damage to adjacent components.

It has been decided that prior to manned operations in the CM the fluorel insulation on the eyepiece will be replaced. Studies are also underway which may lead to development of a non-flammable paper for spacecraft log books and manuals.

Corrective action has also been determined for the four other CM flammability tests in which fires either did not extinguish themselves or spread beyond the immediate ignition area.

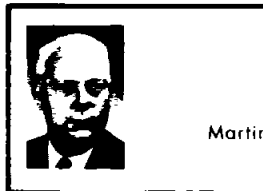
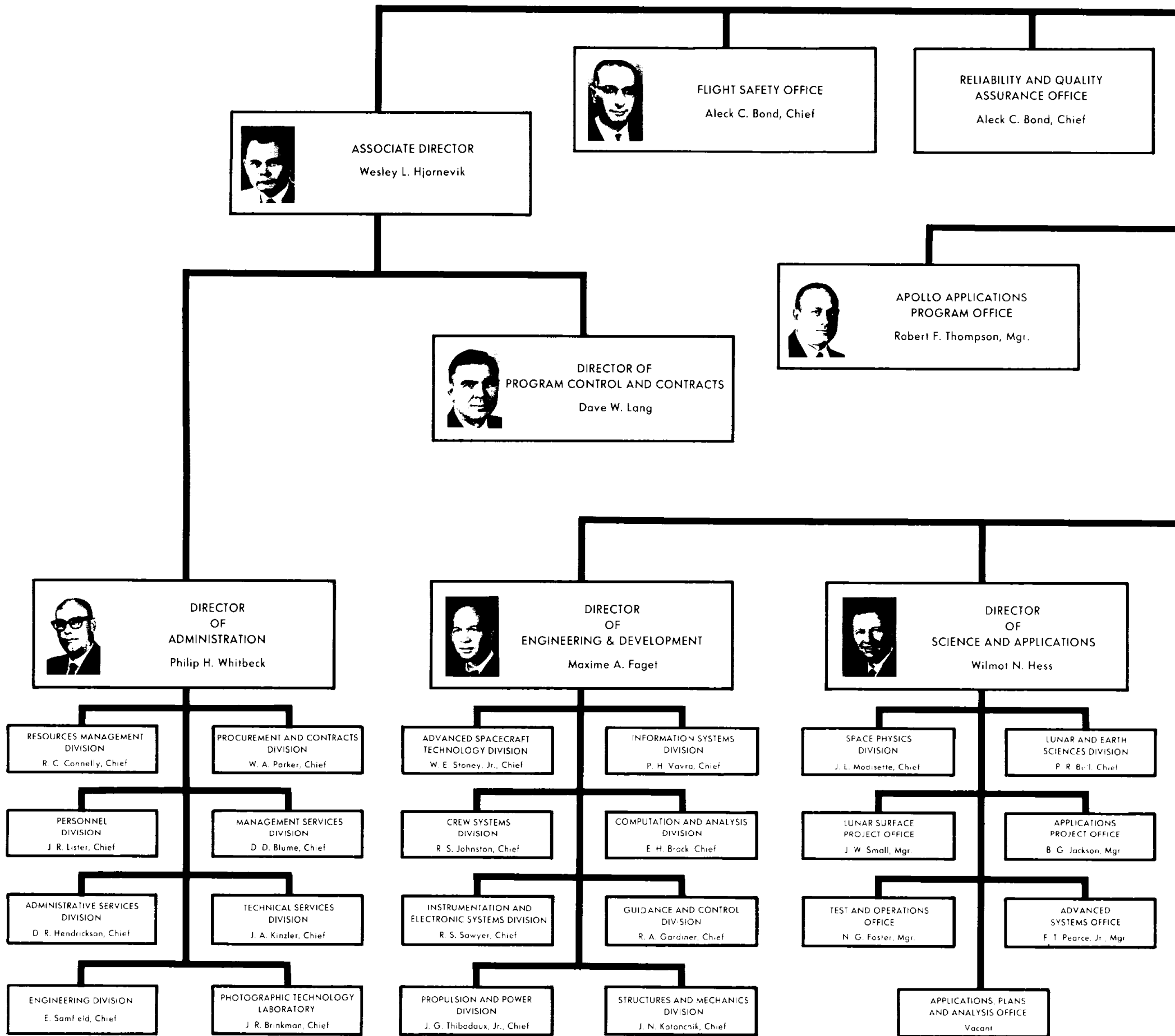
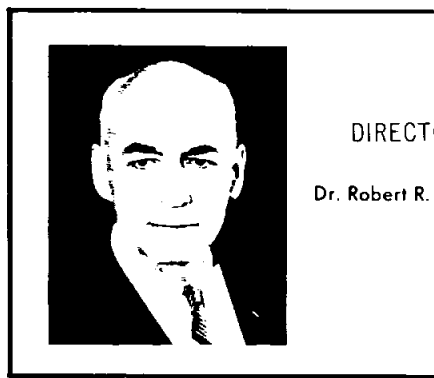
Easily Put Out

All of the fires produced in flammability testing could have been easily extinguished with planned on-board fire extinguishers. From ten to thirty minutes were required to produce significant burning in all but one case, which would give crewmen adequate time to locate and extinguish fires or to leave the spacecraft during ground test operations. In the case of the fluorel eyepiece, the fire grew to unacceptable size in about one minute. However, this fire would have been immediately visible to the crew, allowing them to take prompt action to extinguish the fire.

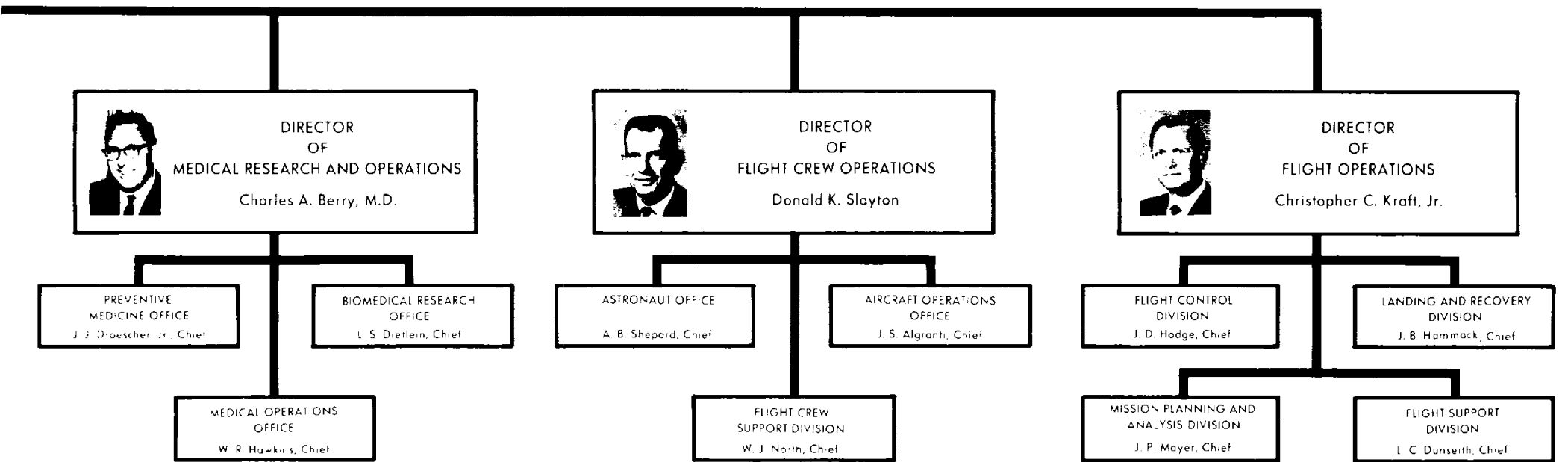
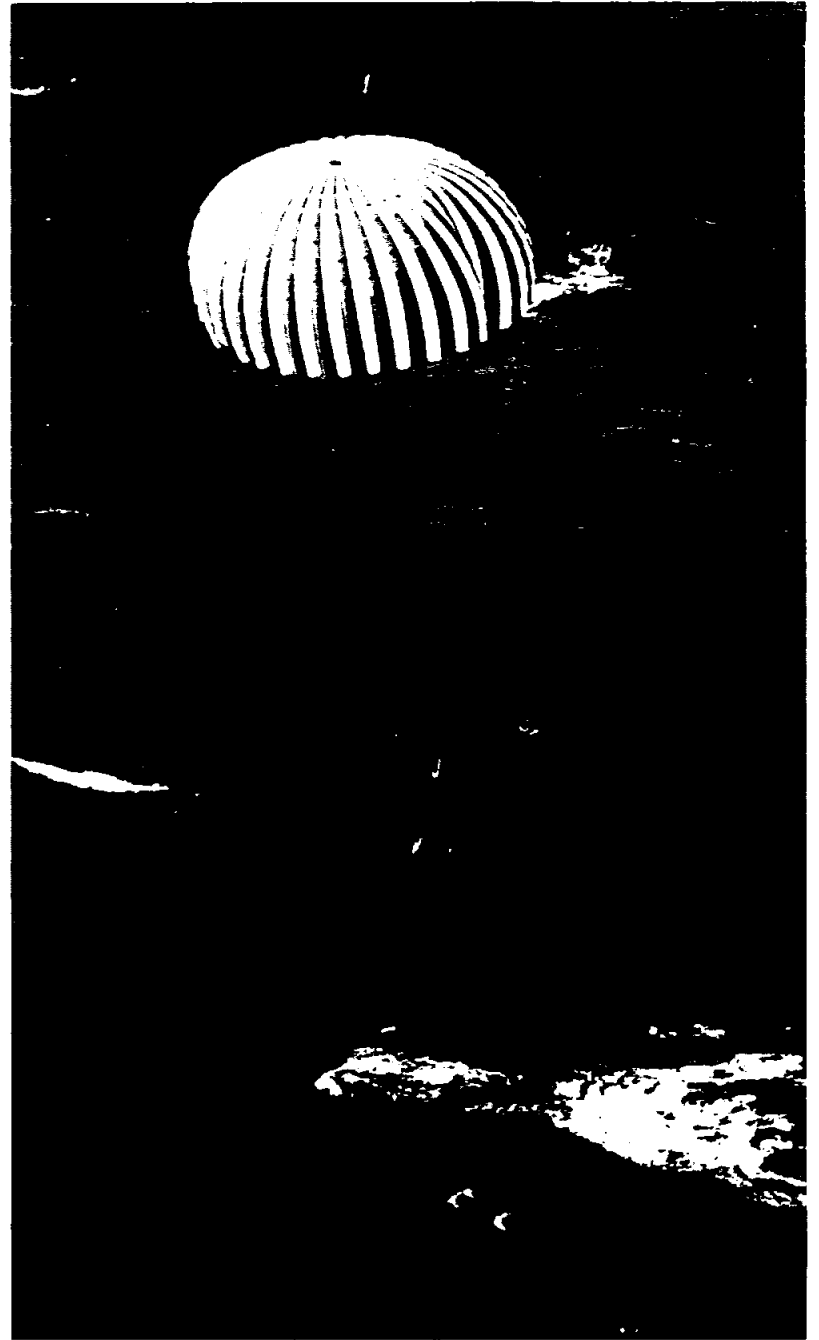
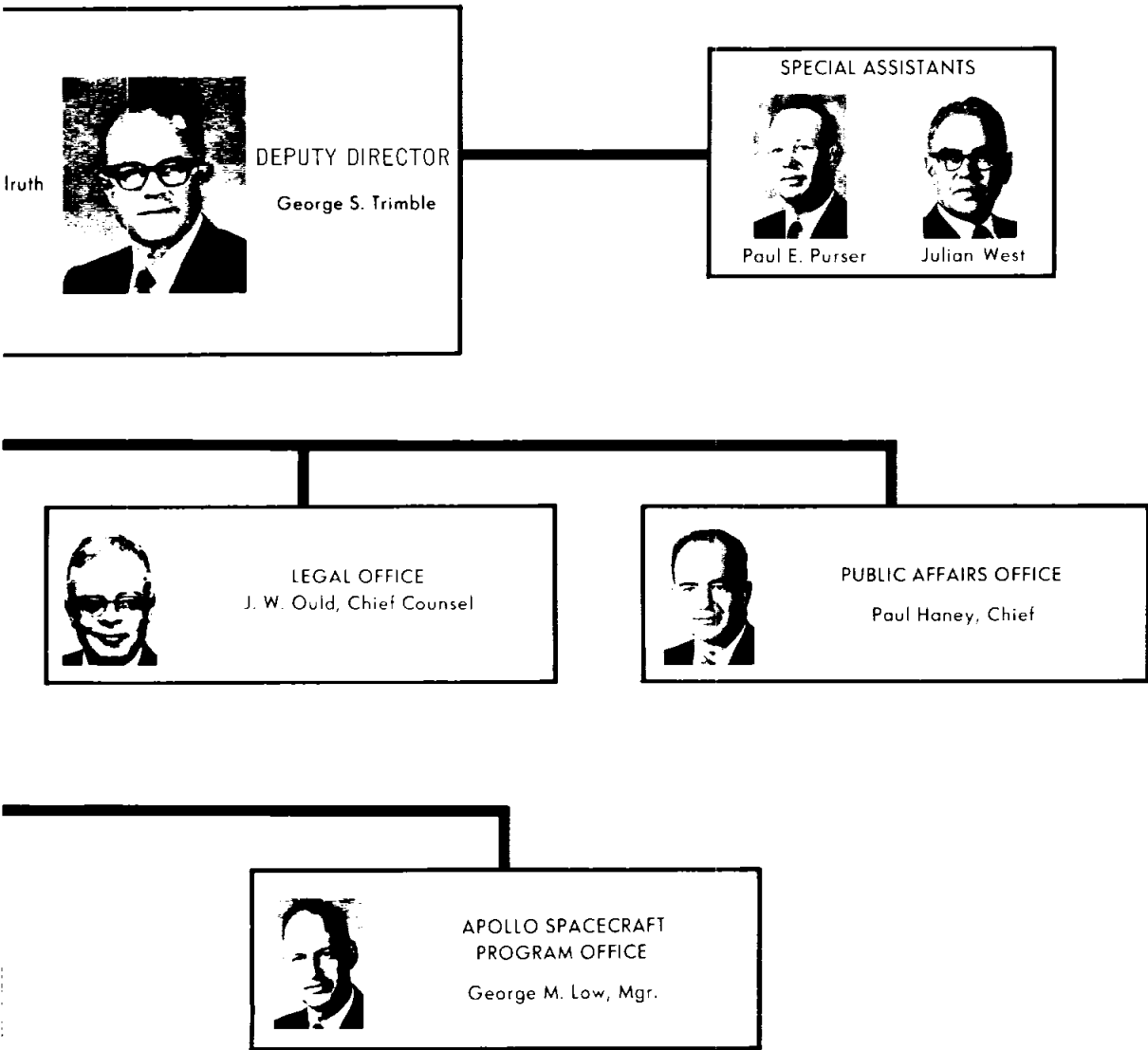
Flammability Test Review Board Chairman Robert Gilruth stated that the results of testing to date indicate a drastically reduced fire hazard has been achieved in the Apollo spacecraft.



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION MANNED SPACECRAFT CENTER



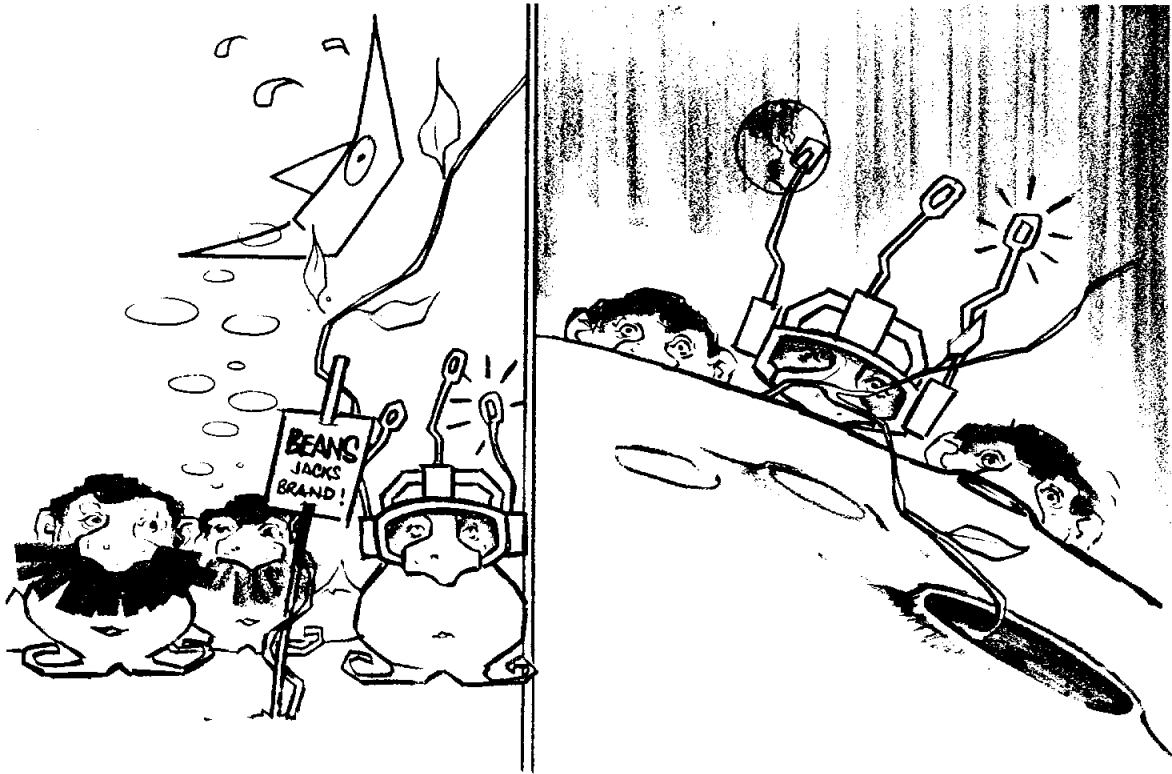
AND SPACE ADMINISTRATION OPER ORGANIZATION CHART



WHITE SANDS TEST FACILITY
Raines, Manager



Long fight with short stick . . .



Public Schools Week Marked

March 4-8 is Texas Public Schools Week, and all parents and interested citizens are invited to visit public schools in the MSC area. During the week, school facilities and teaching methods are open to inspection and observation.

Public Schools Week in Texas is an opportunity for parents to

see first hand the progress their children are making academically and socially at school. Parents are especially urged to set aside one day to visit their children's classrooms.

School administrators and teachers will be standing by to point out new innovations and teaching techniques.

Midget Electric Jets Thrust in Micropounds

Resistojet electric engines capable of only 20 millionths of a pound of thrust will be used to keep the next two Applications Technology Satellites anchored in orbit.

The resistojets on ATS-D and -E will be the first full-scale electric thrusters on operating NASA satellites.

The resistojet is so named because it uses electric resistance to heat liquid ammonia propellant, which is expanded through a jet nozzle for thrust. Generally, the electric thruster operates for long periods.

In the vacuum of space, very low thrust is applied to alter the course or attitude of the spacecraft. The thrust of the resistojet is measured in micropounds, millionths of a pound.

The engines selected for ATS will have thrust of 10-20 micropounds. They will measure about the size of a jumbo fruit juice can, together with connections by tube to the tiny thrusters outside the spacecraft. They will weigh about eight pounds.

ATS-D is scheduled for launch late this year and ATS-E in 1969. In use on the satellites,

resistojet's very low thrust will serve to counteract torque disturbances to the gravity gradient booms which control spacecraft attitude. A resistojet was tested on ATS-III, launched last Nov. 5.

The resistojet engine has been developed in a two-year joint program of NASA's Office of Space Science and Applications and Office of Advanced Research and Technology.

EAA Picks Five For Exec Board

The Employee Activities Association sixth general assembly January 30 elected five new executive board members for two-year terms. They are Executive Vice President Sam Cerniglia, Treasurer Bertus E. Matthews, Vice President-Clubs Mary Dunn, Vice President-Promotion Shirley A. Brown and Vice President-Social Activities Jerry D. Haptonstall.

Board members with one year remaining to serve are President Ed Stelly, Secretary Alice Jernigan, Vice President-Athletics Ray Southers, Vice President-Facilities Bud Henderson, and Vice President-Youth Activities Steve Grega.

NASA Creates Advisory Group

A new Research and Technology Advisory Council has been created to assist NASA in planning and evaluation of research and technology for aeronautics and space.

The council will assess and render judgments on the relative importance of ongoing research, suggest additional work that should be undertaken and advise on the methods for further developing the nation's resources.

The council will be headed by Dr. Raymond L. Bisplinghoff, Head of the Department of Aeronautics and Astronautics of the Massachusetts Institute of Technology. It will be supported by committees representing seven major technology areas and committee members will be leading specialists in these subjects from industry, universities and other government agencies.

A major function of the council will be to advise the Associate Administrator for Advanced Research and Technology, Dr. Mac C. Adams, on research to fulfill NASA and national objectives.

Co-op of Month



DEMONSTRATES INITIATIVE—Nicholas L. Faust of the Advanced Mission Design Branch-MPAD is on his seventh co-op tour with MSC. He is an applied math major at Georgia Institute of Technology. In his assignment, Faust has gained extensive experience in the field of orbital mechanics, particularly in onboard Apollo navigation and guidance. He presently is working in development of an interplanetary matched conic trajectory computer program. His supervisors describe him as an excellent computer programmer in both Fortran and MAC languages, and as having shown "great enthusiasm and initiative in any project assigned to him."

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Director Dr. Robert R. Gilruth
Public Affairs Officer Paul Haney
Editor Terry White
Staff Photographer A. "Pat" Patnesky

Blood Collection Starts Monday

The MSC Blood Bank Monday begins a series of six MSC and contractor site blood collections this month. Operation hours of the bloodmobile will be from 8:30 am to 1 pm.

Dates and locations of blood collection are as follows: February 19—MSC Bldg 8; February 20—General Electric; February 21—MSC Bldg 8; February 26—Ellington AFB Bldg 276; February 27—MSC Bldg 8, and February 28—Lockheed Building.

MSC and contractor employees wishing to join the MSC Blood Bank should contact one of the following persons: Ed Stelly, MSC Ext 3378; Bill Averyt, B&R-N HU 8-2500; Jim Hallmark, NAR HU 8-2720; Ed McCabe, GE 932-4511, Ext 2133; Jerry Holder, Lockheed HU 8-0080; Al Schneider, Dynalectron Ext 7630; Sara Weyer, Boeing 591-5285, and Larry Salyers, AT&T HU 8-1010.

Membership in the MSC Blood Bank insures ready access to a blood supply when an emergency arises in one's family. The charges for whole blood at a hospital can be quite expensive, but for the price of few minutes and the slight sting of a needle in the arm, these expenses can be greatly cut by having an account in the Blood Bank.

I COLLECTED ONE CONTAINER FULL FOR THE INTERNATIONAL SERVICE AGENCIES SARGE

ONLY ONE CONTAINER?



Multi-Agency Drive Starts Here March 4

Preparations are under way for MSC's annual combined campaign for the National Health Agencies and the International Service Agencies—one of the two fund-raising campaigns authorized to be conducted at federal installations each year (the United Fund appeal is made each fall).

Included in the International Service Agencies are Project HOPE, the American-Korean Foundation, and CARE. Ten health agencies working to advance life-saving programs of research, information, and community services, have banded together to form the National Health Agencies. Thus, the combined campaign is designed to support 13 individual agencies in their year-round programs.

During the period March 4-15, MSC employees will be asked to support this worthwhile cause. Contributions may be divided among all agencies, or desig-

nated for specific agencies of the donor's choice.

No dollar goals or quotas are being assigned. In fact, contributions are to be placed in sealable envelopes and will not be opened at MSC. A goal of 100% participation is sought.

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Roundup Swap-Shop

(Deadline for classified ads is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Send ads in writing to Roundup Editor, AP3. Ads will not be repeated unless requested. Use name and home telephone number.)

FOR SALE/RENT—REAL ESTATE

3-2-2 brick in Bayou Chantilly, Dickinson, large family room w/cathedral ceiling and fireplace, formal living room, large master bedroom, laundry, electric kitchen, landscaped, large lot, patio w/gas grill, fenced, carpets and drapes, garden house. Available immediately. Low twenties, 150/mo. Atwater, 534-5684 for appointment.

2 bedroom house for sale or rent, single attached garage, fenced, Oak Meadows Addition, near Allen Genoa Road. Linda Blankenship, MI 5-0188.

Contemporary brick on 1.4 wooded acres, 3-2-4 screened porch, utility room, electric kitchen, built-ins, central heat and air, many extras. \$30,800. Pesman, 203 East Edgewood Ave., Friendswood, HU 2-7692.

Two lake front lots located near Wilmington, N.C. Excellent vacation, retirement, investment area. John H. Cooper, 944-7049 after 5.

Waterfront property for rent: perfect for boat owners. 2 bedroom furnished home with large den & fireplace. South side Clear Lake at 1818 PK Drive. 4-car carport, large barbecue, large patio. Very private 1/2-acre fenced grounds. Your own personal \$6,000, 250 ft. pier with 2 enclosed boat stalls with sundeck on top. 1 stall equipped with electric boat hoist. Ideal for bachelors or family. Bill Munro, 877-2219.

Contemporary 4-bedrm., 3-bath home for sale by owner. Has many extras. 24,000 sq. ft. Near Clear Lake with boat launching facilities available. 2219 Bayou Drive, directly across the street from Clear Creek High School. Price \$26,500. 3 years old. George Carlisle, 932-2836 after 5.

House for sale by owner, Newport subdivision, 4 bedrooms, 2 baths, double garage, living room, dining room, den, built-ins, attic storage, carpeted. Drapes included. \$1700 equity, \$148/month. John Lancaster, 932-4654.

FOR SALE—AUTOS

65 Chevrolet Super Sport V-8, air conditioned, radio, heater, overdrive. George A. Zupp, Jr., HU 2-7156.

56 Chevrolet 2-dr. sedan, air conditioned, good second car. Al Bean, HU 8-0191.

59 Oldsmobile convertible. You have seen and admired this car and now you have a chance to own it! Like new tires and top; power brakes, power steering. \$300 or best offer. Howard W. Tindall, HU 2-7719 (Friendswood).

65 Corvair, air cond., radio, stick shift, excellent condition. D. W. Lang, 877-4171.

64 Ford Galaxy 500. Burgundy with black interior, automatic 8 with power steering, air, heater, radio. Good tires, original owner, very good condition, \$1000. Jean Alexander, WA 3-8562 after 5.

61 Corvair Monza, 4 speed transmission, good paint, 70,000 miles, great work car. Sloan Kirk, Jr., 877-1034.

64 Lincoln Cont., full power, air cond., AM-FM radio. \$1,800. J. M. Lee, HU 2-3044.

62 Chev Super Sport Impala, V-8 auto. transmission, radio, heater, air conditioned, extra clean. B. K. Vermillion, 944-8282 after 6.

64 Jaguar XKE Roadster, white with black top and interior, fresh paint, two new tires, AM/FM radio, wire wheels, 3 years old, extra clean, will sell for 4-year bluebook retail. John H. Boynton, 946-1363 or 944-9319 and leave phone number.

63 Chevrolet, 6 cyl., powerglide, A/cond., 67,000 miles, excellent inside and out, good family or second car. \$795. F. Kirkland, 932-4101.

63 Willys jeep, 4 wheel drive, excellent condition. John H. Cooper, 944-7049 after 5.

54 Buick Special, V-8 automatic, sharp body, good running condition. \$175. John P. Hunt, HU 8-3530, ext. 2286.

62 Chev. Biscayne. Excellent condition, 6 cyl., 4 dr., radio, heater, air conditioning. Paul Stokholm, Webster, 932-3753.

62 Ford Ranchero, runs good, good tires, radio & heater. Ernie Camp, WI 5-6189.

58 Chevrolet station wagon, good running condition. 348 engine, new exhaust system. \$150. Frank Wittler, 534-3916.

29 Model A Ford 2-dr. sedan, mechanically sound, body in near excellent condition, runs good. Larry Anrim, HU 8-2757 to see.

66 Dodge 1/2 ton pickup. Radio, heater, automatic trans., bucket seats, long wheel base, still under warranty. Bill Johnson, GR 4-3120.

57 Chevrolet 4-dr. hardtop, auto. trans., power pack heads, runs good. Bill Johnson, GR 4-3120.

67 Austin Healey Sprite, 15,000 mi., excellent condition, must sacrifice. Rick Nygren, MI 3-2622.

64 Ford, 4 dr. XL hardtop, 352 cu. engine, auto. trans., air, power brakes, steering, radio, heater. Jim Mager, HU 2-1335.

59 Triumph TR3. New black paint & tires. Extra clean. \$550 cash or trade for VW in equal condition. D. C. Pollard, 2530 Violet, Pasadena, HU 7-0024.

63 VW sedan, 4 new tires, radio, 58,000 miles, \$725. H. Hertz, HU 8-4226.

FOR SALE—MISCELLANEOUS

Interested in Viviane Woodward cosmetics? Flossie D. Leggett, 591-4591 after hours.

61 Chevrolet Engine disassembled and ready for rebuilding, power pack heads and four-barrel, intake and exhaust manifolds. \$65 N. Corbett, ext. 5961 (no home phone).

1960 Glaspar Citation, six individual seats, 75 hp Evinrude, tilt trailer, top and stern cover, extras, excellent condition, \$1250. N. Corbett, Ext. 5961 (no home phone).

Fly retractable gear with the Aero Glub Inc. for MSC and contractors. K-Bonanza, IFR, 195 mph, \$16/hr. wet; Cessna 172 \$9/hr. and 150 \$7/hr; instructor \$5/hr. Bob Ward, 877-3187.

Lionel Train. Two engines, 10 cars, 46 sections of track, 1 transformer, trestle set, lighted platform, plus an assortment of auxiliary equipment. \$25. Mary Dunn, GR 9-1295 after 6.

Western Flyer girl's 26" blue bicycle. In perfect condition—like new. \$20. Mary Dunn, GR 9-1295 after 6.

First-day covers of "U. S. In Space" stamp with Art-master cachet. 50 cents each. Eggleston, 877-1261.

Danish Modern sofa-olive green. Reverses to blue/green stripes, \$35. Matching chair, \$15. Excellent condition. Two brown tweed contemporary matching lounges. \$25 each. Boat cover, fits 16-foot boat plus motor cover. Excellent condition \$10. Fox, 591-4460.

16 ft. dory, double ender, motor well, trailer, excellent condition, \$400. W. C. Huber, 877-1276.

Apartment size 4-burner stove with oven, needs paint on sides, \$15. Heathkit FM-4 FM tuner with manual, \$20. Craftsman rotary lawnmower, \$30. Trailer hitch for 1965 Mustang, \$15. W. G. Pratt, 932-2600.

Baby bed w/mattress, excellent condition, \$15. Girls 26" bicycle, \$10. L. D. McBride, 488-0686.

Sailfish: wooden hull and mcst. Needs work. No trailer. Must sacrifice at \$75 or best offer. Wilson Young, HU 2-1563.

17 ft. Explorer sailboat, dacron sails, trailer. Perfect for daysailing or racing. Good family boat with plenty of room for passengers and storage. Ted Sampsel, GR 1-0172.

Puppies, 5 registered black Labradors, born January 18, 591-2175.

New Home zig-zag sewing machine and cabinet, \$40. Two book cases, \$10 each. Step end table \$5. Antique 4-drawer chest with 30-inch base. T. Ward, HU 7-2266.

China cabinet, antique. Curved glass front and sides. Mahogany finish on oak. 36 inches wide, 56 inches high topped by 9 inch high curved mirror in scroll frame. 4 scroll-type legs. Excellent condition. \$125. Leona Germany, MI 3-4456 after 6.

Used black sofa and chair, excellent condition, \$50. C. Glassburn, 932-4682.

14 ft. Larson fiberglass boat, 66 model, 50 hp Mercury motor and Gator trailer, in excellent condition. \$1300. J. A. Fosbrink, 954 Seagate Lane, HU 8-1130 after 5.

Schneider Tele-Xenar 360 mm telephoto lens for 4 X 5 in. Compur M shutter on Graphic lens board. Viewfinder mask, filter, and 4 X 4 lensboard. \$175. Tom Carhart, HU 2-1844.

Black female miniature poodle. AKC registered, seven months old, \$45. Al Joslyn, 944-5817.

Tent-shelter, 12 ft. X 12 Ft., nylon net sides are 6 ft. high. Complete with steel poles, ropes and stakes. \$45. Ed Wagner, MI 3-8816.

Bowling ball, bag, and size 12 men's shoes, \$20. Ed Wagner, MI 3-8816.

Motor bike, 1966 model 115 Mini-Bike, 3 1/2 horsepower Clinton engine. Original cost \$114.95—asking \$100. Joe Schisser/Glenna Schisser, A.C. 713, 966-1835.

Dyna FM-3 stereo tuner, \$65; Dyna stereo 35-W amp., \$60; Allied speaker systems, 12" X 6" horn tweeter, bath for \$90; Garrard 50 Mk II changer, \$35. Goodrick, NA 2-8341.

Outboard, 7 hp, air cooled Eska, used less than 2 hrs; w7. 34 lbs., warranty, ideal for Jon Boat or auxilliary for sailer. Seeking \$100 or trade for shotgun. W. E. Hull, 877-1324.

Mens professional roller skates, black, size 7 shoe, \$20. Plexiglass windshield, walk thru type, for 20 ft. boat new, never used \$35. Complete mechanical steering rig for 16-17 ft. boat w/extras, new, \$45. Sabre saw, \$7. Kaigler, 877-4731.

Pekingese puppy, male, parti-colored. Not registered, \$25. Joe Vickers, HU 5-2726, Pearland.

Yashica twin-lens reflex camera E.R.C. and accessory close up lenses, \$45 (?). Llewellyn, HU 8-0736.

TV, tape recorder, 8 mm camera & projector, 15 watt hi-fi amp, FM tuner, 50-watt Harmon-Kardon stereo amp., communications receiver, Lafayette; LPV color TV antenna, L. M. Yates, 946-3225.

Honda Super 65, black, 1966 model. \$115 or make offer. Grady G. Jeffrey, Baytown, 427-2449.

Electrolux vacuum cleaner, model 30, new hose, \$25. Circular rotary clothes line, \$5. VM two track portable tape recorder, \$50. W. G. Pratt, 932-2600.

Thoroughbred Dachshund puppies, 6 weeks old, Feb. 13. Puppies are spirited, fat, in good condition. Price is \$35. Tom Woods, HU 2-7310.

Free: 6 puppies. Two females, four males. Mother is small Collie mutt, father was transient English Setter. Ready for transfer in 2 weeks. John H. Cooper, 944-7049 after 5.

Spanish Dining Room set, must see to appreciate. Dan Cook, Apt. 6B, Tall Timber Apartments, Dickinson, Texas.

Female Chesapeake Bay Retriever, 8 months old, \$50. Dan Cook, Apt. 6B, Tall Timber Apartments, Dickinson, Texas.

English Pointer pups, AKC Champion sire & dam, liver and white, \$75 and up. Rita Heywood, Dickinson 534-3979.

Ladies hearing aid eyeglasses, gold trimmed like new. Cost over \$400 one year ago—\$95. Rita Heywood, Dickinson 534-3979.

Philco hi-fi, \$35. G.E. washer, \$35. Both in working condition. R. Bake, GR 1-2814.

14 ft. aluminum runabout, 25 hp motor & trailer. Like new. \$495. Joe Fink, GR 2-8955.

Utility-camper trailer, 14" wheels, U-Haul style, 3 bunks, aluminum, insulated, beautiful interior, plenty storage, extras: 20# butane bottle, hose and connectors; stove and light. Coleman 3-way cooler, holds 25# block ice. Canvas extension. Two large doors on rear accommodate use as utility trailer. Best offer. See at EAFB. Steveson, HU 3-3928 day only (no home phone).

Like new Hagstrom electric guitar. Two pickups and Vibrato. \$130. John Atkinson, 932-3664.

21 in. black and white RCA upright console TV. Works good. \$20. Larry Anrim, HU 8-2757.

Free dirt. Flower bed earth, original cost \$25 per truck load. You haul it away free. R. B. Lang, HU 8-0149.

Heathkit VTVM, EICO sine wave/square wave generator, RCA multimeter, RF generator. R. B. Lang, HU 8-0149.

Factory made "Hale" 2-horse trailer, has 2 coats of primer, is ready for final coat of paint. Pulls exceptionally well. Bill Johnson, GR 4-3120.

8 ft. Texas scooter, fiberglass over plywood, motor well, \$50. Fred Chalfont, HU 2-7992.

New condition trailer hitch for Karman Ghia VW. \$20 cash. A real good buy. D. C. Pollard, HU 7-0024.

Instrument pilot and private pilot ground school courses being scheduled by the aero club Inc. for MSC, contractors and families. Low rates. Call Sal Tupoli 591-3300, ext. 3320 or attend next meeting at MSC Bldg. 2, Room 716 at 5 pm Monday March 4.

Redwood patio set, chaise lounge, couch w/built-on end table, and matching tea cart. cushions need recovering. Original cost \$130. Sell for \$30. Picnic table, two benches and two end seats. \$7.50. Vanderoef, HU 8-2257.

Sears lawnmower with grass catcher, \$15. Sears Coldspot frost-free refrigerator, 16 cubic feet, \$150. H. Hertz, HU 8-4226.

WANTED

Wollensak tape recorder. B. C. Locher, GR 1-4387.

Tape recorder, cheap battery operated, need not work; and quality stereo tape deck or recorder. L. M. Yates, 946-3225.

Aurora Expedition Gets Northern Lights Photos

More than a week of flights high above the Earth's Arctic wastes opened a large-scale scientific assault on the secrets of the Aurora Borealis or Northern Lights.

In a series of flights which began January 19, the 1968 NASA Aurora Expedition has already produced hundreds of unique color photographs of the Aurora. Other detailed science data being gathered is considered even more important than the pictures.

Making their observations from carefully stabilized platforms in an instrumented aircraft flying at 32,000 to 40,000 feet, expedition scientists reported unusually clear night views of towering Aurora displays.

By flying at these altitudes, the expedition Convair 990 jet

aircraft "Galileo" is above five-sixths of the Earth's atmosphere, thus avoiding its obscuring effects on precision observations.

Press Club Marks Sixth Anniversary Of Glenn's Flight

Now that the Gemini Program has been completed more than a year, the Escape Velocity Press Club is going to throw a Gemini XIII scrub party since apparently the program will have no more than 12 missions. Getting double mileage, the scrub party will mark the sixth anniversary of John Glenn's three-orbit flight aboard Mercury spacecraft Friendship 7.

The party will be at the Nassau Bay Hotel February 17 starting at 8 pm with a \$1.50/person cover charge. Tickets will be on sale at the door, but Harry Herranen at HU 8-1400 would like an advance headcount.

Glenn will not be able to attend the party, but several Gemini crewmen and their wives have planned to come.

Judokas Move

The NASA Judo Club has switched its meetings to the Harris County Park hall on NASA Road 1 each Thursday from 6 pm to 8:30 pm. Prospective members are welcome.

Spanish Club Starts Two Classes Feb. 26

The MSC Spanish Club February 26 will begin advanced and beginner conversational Spanish classes which will be augmented by visiting speakers and audio-visual material on Latin-American countries and culture. The classes end May 20.

The next Spanish Club meeting will be February 19 at 5:15 pm in Room 108 Bldg 13. *Vengan todos.*

Go Texan

Hodge Receives Fleming Award

John D. Hodge, chief of Flight Control Division, yesterday received the Arthur S. Fleming Award in ceremonies held by the Washington, D. C. Junior Chamber of Commerce. The Fleming Award is made each year to 10 outstanding men in federal service in scientific/technical and administrative fields.

Prior MSC recipients of the Fleming Award include Director of Flight Operations Christopher C. Kraft, Jr., MSC Associate Director Wesley L. Hjernevik and Director of Engineering and Development Maxime A. Faget.

Mission Planner To Address ISA

M. P. Frank of Mission Planning and Analysis Division February 28 will be the featured speaker at the Apollo Section of the Instrument Society of America. Frank will describe how Apollo lunar landing launch windows for daily and monthly periods and why they are necessary.

The dinner meeting will begin at 6:15 pm at the Holiday Inn on NASA Road 1. Call HU 8-0900 for reservations. Non-ISA members are welcome.

U. S. SAVINGS BONDS AND FREEDOM SHARES

Would like to buy 5hp to 7—hp outboard motor in good condition. Don Heywood, Dickinson 534-3979.

Bunk beds with mattresses. R. B. Lang, HU 8-0149.



AGENA CLOSEUP—Cooperative education coordinators from three universities working with MSC in the co-op employee program examine an Agena Target Vehicle engine during a visit to MSC January 24. Left to right are Barbara Lerdon of MSC Training Branch, Don Burrowridge of University of Akron, Joe Plant of Florida State University and Jack Westberry of Auburn University. They were among some 300 persons from schools, industry and government attending the January 21-24 Cooperative Education Conference at the Shamrock-Hilton.

El Paso Computer Seminar Studys Latest Data Processing Methods

Problems and progress of automatic data processing in space research are being explored by representatives of industry and NASA in a seminar at El Paso, Tex., yesterday and today.

The seminar is sponsored by NASA's Intercenter Committee on ADP (Automatic Data Processing) which includes management and technical members from all field centers. Ninth semi-annual meeting on the subject, the El Paso event is the first to invite participation and papers by leading figures in the computer industry.

New techniques in automatic data processing including use of

Orbiter Scuttled

(Continued from page 1)

Cape Kennedy on August 10, 1966, held a successful launch each three months for five missions, completing a total of 6,034 orbits of the Moon.

In little more than a year, the orbiting cameras photographed more than 99 percent of the lunar surface at resolutions 10 times better than those possible with telescopes on Earth.

From Lunar Orbiter photography, eight candidate landing sites for project Apollo crewmen were selected, and scientific understanding of the lunar surface was increased manyfold. From tracking information, detailed knowledge of the Moon's gravitational field was attained.

The Lunar Orbiter program was directed by NASA's Office of Space Science and Applications and managed by NASA's Langley Research Center, Hampton, Va. The Boeing Co., Seattle, Washington was the prime spacecraft contractor.

remote input-output equipment will be studied in relation to NASA's current conversion to "third-generation" computers.

Seminar chairman is Eugene H. Brock, Chief of MSC Computation and Analysis Division. The Intercenter Committee Chairman is Paul Fuhrmeister, Chief of the Analysis and Computation Division, Langley Research Center, Hampton, Va.

Heading the list of speakers are Kenneth R. Webster, NASA, Chief, ADP Management Branch, Office of Tracking and Data Acquisition, which has functional responsibility for ADP; and Dr. Bernhardt L. Dorman, Assistant Administrator, Office of Industry Affairs.

Seminar papers will be delivered by L. H. Woodward, Ames Research Center; George Roush, MSC; Robert Jirka, Jet Propulsion Laboratory; Dr. Heinz Trauboth, Marshall Space Flight Center; Sylvester De Mars, Kennedy Space Center; Dr. John Poduska, Electronics Research Center and M. K. Morin, Langley Research Center.

Other speakers from government will be Joseph F. Cunningham, ADP Management Branch, Bureau of the Budget; Dr. Herb Grosch, National Bureau of Standards and from NASA, Thomas F. Woods, MSC; William F. Cahill, Goddard Space Flight Center, Greenbelt, Md. and Jesse H. Hall, Lewis Research Center, Cleveland.

Papers will be given by the following industry representatives: Dr. Richard I. Tanaka, California Computer Products, Inc., Anaheim, Calif.; Allen Rose, International Business Machines, Yorktown Heights, N.Y.; Earl Joseph, Univac, De-

fense Systems Division, St. Paul; William Quirk, American Telephone and Telegraph, New York City and Arthur F. Rosenberg, Scientific Data Systems, Santa Monica, Calif.

Also speaking for industry will be: Dr. Jacob Rabinow, Control Data Corporation, Rockville, Md.; Dr. Sullivan Campbell, Graphics Sciences, Inf., Rochester, N.Y.; James Babcock, Allen-Babcock Corp., Los Angeles; Roy Nutt, Computer Sciences Corp., El Segundo, Calif. and I. D. Nahama, Inc., Washington, D.C.

Globetrotter



WINS TRIP—Michael H. McKann, 21, son of Robert McKann of ASPO Test Division, recently won a round-the-world trip on television's "I Dream of Jeannie" show. He is a junior at Texas Technological College majoring in landscape architecture. On the day he was notified of winning the trip, he was also selected to do the landscape architectural design for a new Texas Tech gymnasium complex.

Medics See Campagna Demonstrate Hypnosis

Ed Campagna of MSC Engineering Division appeared February 1 before the Southwest Society of Experimental Hypnosis and the Academy of Clinical and Experimental Hypnosis to demonstrate stage hypnosis techniques.

Campagna explained that the stage hypnotist has a multitude of unfavorable conditions to overcome, such as noisy nightclub audiences, drunks and waiters serving dinner, etc. On the other hand doctors, dentists, and other medical professions have all things in their favor: soundproof rooms, soft lights, music, and subjects who desire to be hypnotized.

However, Campagna pointed out, the stage hypnotist induces hypnosis in a matter of seconds while the medical profession usually takes many minutes, and sometimes longer, to attain the same degree of response. Campagna also pointed out that the stage hypnotist must attain a state of deep hypnotic sleep in order to assure that the subjects will perform the posthypnotic suggestions that are so necessary to an entertaining stage performance. Since most of the benefits derived from medical hypnosis are also usually most successful when deep hypnosis is attained, it would be beneficial for the medical profession to learn the techniques required to induce this state quickly.

Campagna began his association with hypnosis while studying for his engineering degree at Iowa State College. He became so interested in hypnosis that he selected his electives in the psychology field and completed courses in physical reactions. He has performed as a professional magician and hypnotist for over 20 years and has appeared in many major nightclubs and theaters in this country.

His success with pain suppression and elimination on wounded comrades in World War II was so successful that he was requested to teach Army doctors and dentists hypnosis so that they would relieve pain and decrease the use of narcotics which sometimes caused addiction. Working closely with doctors and dentists, he has used his talents for painless childbirth, and dental extractions using hypnotically-induced anesthesia.

He has had amazing results in the field of weight reduction

Bridge Standings

Winners of the January 30 MSC Bridge Club master point nine-table Mitchell movement game were: North-South—Jerry and Elsie Lee, 1st; B. Durbin and B. Russell, 2nd. East-West R. Perkins and K. Krause, 1st; T. T. Fisher and D. J. Hill, 2nd.

A five-and-a-half table Howell movement fractional master point game was held February 6, and winners were: F. Herrmann and R. Cohen, 1st, and D. Juzewski and N. Faust, 2nd.

and explains that hypnosis is the perfect tool because the subjects do not have the desire to eat the foods which make them obese, and are not under the normal mental strain usually associated with diets. It is also interesting to note that weight reduction through hypnosis usually has lasting effects and the subject does not usually regain the weight as is usually true in most diet programs.

Campagna also remarked that the cigarette smoking habit is one of the easiest to break with hypnosis and that it too is usually lasting.

After his talk, he demonstrated his rapid hypnosis techniques. He hypnotized four subjects in not more than ten seconds each. He demonstrated the use of posthypnotic suggestions which are so necessary to produce an entertaining show and for any type of hypnotherapy.

He also demonstrated a "negative hallucination" in which he told the subject that upon awakening he would not hear, see, or feel him (Campagna) until a certain signal is given. Any object picked up by the performer appears to be "floating" in the air because the subject cannot see the performer.

Campagna concluded his performance by placing two subjects in a cataleptic state. After stiffening their bodies he stretched them between two chairs with only the necks and ankles supporting the body.

Campagna recently received the "Outstanding Magician" award by the Houston Association of Magicians.

Dental Problems Topic of Talk Next Wednesday

Children in TV commercials burst into living rooms screeching "Look Mom, no cavities!" But how many of these children's parents could likewise go home after a dental checkup boasting of having no cavities?

Dr. William J. Frome of the MSC Preventive Medicine Office believes that regular dental checkups are as important as regular physical checkups. Preventive dentistry will be Frome's major topic at next Wednesday's MSC Educational Health Program at 10 am in the Auditorium.

Frome will cover the changing concepts in dentistry and why, in the routine repair of teeth and in treatment of other mouth diseases, more and more emphasis is being placed on the prevention of dental disease. He will present evidence that a preventive dentistry program can be successful if there is complete cooperation between the dentist and the patient.

Frome also will outline the rationale of such a program, cite examples of successful cases and explain the means of individual participation.