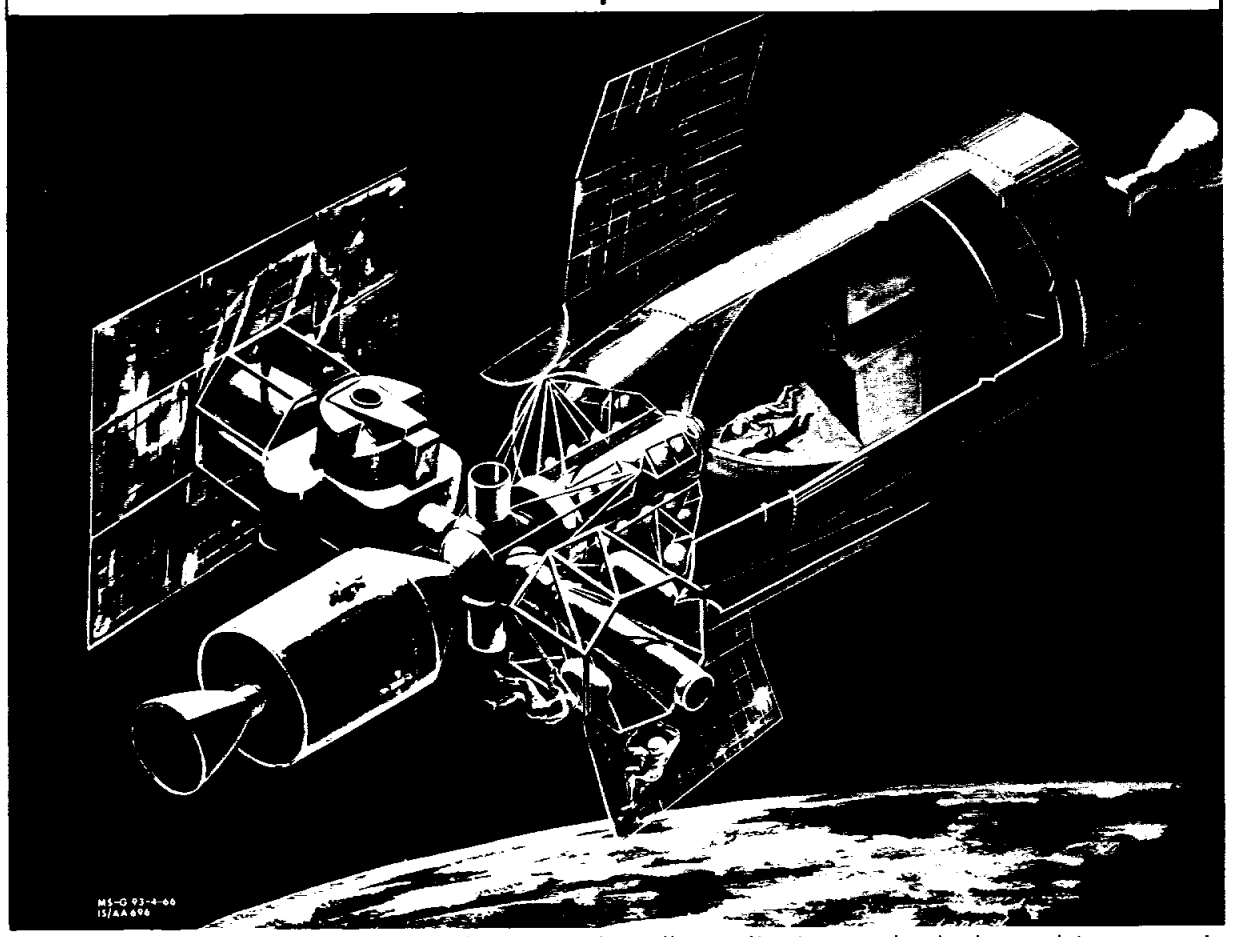
Clustered Space Station



ORBITAL WORKSHOP—Artist's concept shows several Apollo Applications payloads clustered into an early version of a space station. Components include the spent S-IVB stage converted into an orbital workshop, right; mapping and survey systems module; Apollo telescope mount, and Apollo command and service modules. Both the Apollo telescope mount and the orbital workshop deploy solar array panels for power conversion.

ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

VOL. 6, NO. 9 FEBRUARY 17, 1967

3 Apollo Missions Scheduled for 1967

Dr. George E. Mueller, NASA Association Administrator for Manned Space Flight, has announced that NASA will proceed with the launching of the three unmanned Apollo flights presently scheduled in 1967.

The unmanned flights are:

AS-501, the first launch of a Saturn V, scheduled for the second quarter with a command and service module.

AS-206, an unmanned lunar module mission on an Uprated Saturn I, scheduled for the second quarter of this year.

AS-502, a second Saturn V launch, scheduled in the second half of the year with a command and service module.

NASA Centers and contractors have been instructed to proceed with Apollo work on the assumption that the first manned orbital flight will be a Block II command module and service module on an Uprated Saturn I; that thereafter manned orbital missions with command, service and lunar modules will be flown on either the Saturn V or dual Uprated Saturn I launch vehicles.

When the AS-204 investigation is completed, changes determined as necessary from the findings will be made and flight schedules established.

In a February 3 memorandum to NASA Administrator James E. Webb, Deputy Administrator Dr. Robert C. Seamans, Jr. reported the initial findings of the Apollo 204 Review Board. He said that no direct indication of the origin of the fire had been found through a preliminary review of test data recorded during the simulated countdown in which the fatal Apollo 204 flash fire occured.

The memorandum further outlined Board plans to disassemble spacecraft 012 in parallel with spacecraft 014, flown from Downey to KSC, in an attempt to pinpoint the fire's origin. Special teams were assigned by the Board to investigate specific areas of the accident, such as chemical/spectrographic analysis of damaged components to identify the propagative history of the fire and relating the propagative history to flammability characteristics of spacecraft materials, while another team conducts analyses and tests to establish possible ignition sources.

Seaman's memorandum outlined the time sequence from the time the crew first reported the fire until the cabin ruptured and the external power was shut off. The memorandum also stated that the official death certificates for the Apollo 204 crew listed the cause of death as asphyxiation from smoke inhalation.

The Apollo 204 Review Board is chaired by NASA Langley Research Center Director Dr. Floyd Thompson.

GSFC's Dr. Hess Appointed Head Of Science-Applications Directorate

Dr. Wilmot Norton Hess, 40, Chief of the Theoretical Division of the NASA Goddard Space Flight Center, Maryland, has been appointed Director of the newly-organized Science and Applications Directorate at MSC.

Dr. Robert R. Gilruth, MSC Director, said Dr. Hess, a nuclear physicist formerly on the teaching and research staff of the University of California, will assume his post at MSC in the near future.

MSC's Science and Applications Directorate was organized at the beginning of this year in recognition of the increased emphasis on the scientific and applied aspects of NASA's manned space flight activities.

Dr. Hess, who has published more than 40 articles on radiation fields and energetic particles, will lead the new Directorate in the planning and implementation of major programs in the areas of lunar science, earth resources and manned meteorology programs.

The Directorate activities will also include conceiving, developing and integrating experimental packages for science and applications programs, provision of design data and real-time mission information on radiation, micrometeorites and lunar surface conditions for manned missions; supporting principal investigators in integrating their experiments into the manned space program; supporting astronaut training in science areas and experiment operation; and managing the lunar sample program.

Dr. Gilruth said the appointment of Dr. Hess to head the Directorate brings to the post a nationally-recognized scientist who will lead investigators and experimenters in the broadening space research aspects of Manned Spacecraft Center's activities.

Robert O. Piland, who has served as Deputy Director of the organization since it was formed, will continue in this capacity.

The new unit will employ 230 people in five offices and two divisions. Offices are Advanced Systems, Applications Analysis, Lunar Surface Project, Applications Project and Test and

(Continued on page 8)

Dr. Vette to Head Space Data Center

Dr. James I. Vette, 39, has been appointed Director of the National Space Science Data Center (NSSDC) located at the Goddard Space Flight Center, Greenbelt, Md.

Construction of a $1,491,600, three-story, 50,000-square-foot building to house NSSDC is nearing completion at Goddard, which is a field center of the National Aeronautics and Space Administration.

The new NSSDC will be the central facility for the collection, organization, storage, retrieval, announcement and dissemination of U. S. space science data obtained from satellites, sounding rockets, ballons and high-altitude aircraft. Data housed at the center are available to the worldwide scientific community.

Dr. Vette comes to Goddard from a post as staff scientist at the Space Physics Laboratory of the Aerospace Corp., Los Angeles, where he conducted satellite research and worked with trapped radiation models.

Lunar Orbiter III Begins Snapping Landing Sites

Lunar Orbiter III Wednesday was scheduled to begin its photographic mission of possible Apollo landing sites on the moon after a deboost maneuver Sunday which placed the spacecraft into an elliptical orbit with a 34.1 mile perilune and a 1,144 mile apolune. Some 12 major landing sites along the lunar equator are scheduled to be photographed and the pictures televised back to earth.

The spacecraft was launched February 4 from Kennedy Space Center atop an Atlas/Agena launch vehicle, and a slight midcourse correction was commanded from the NASA Jet Propulsion Laboratory in Pasadena, California.

The Big Moment

EENY, MEENY, MYNEY, MOE!—Five-year old Vicki Lynn Johnson riffles through a hopperload of tickets to draw the three grand prize winners in the Cafeteria Week final drawing. Milton Contella of Flight Crew Support Division won the first-prize color TV set. Carolyn Dudley of Univac won the second-prize trip-for-two to Acapulco, and James J. Taylor of Mission Planning and Analysis Division won the third-prize portable AM/FM radio/record player. Helping Vicki make the drawings are Roy C. Aldridge and Adaron B. Jordan of the Administration Directorate office.

Contract Signed For Final Five Saturn V Stages

NASA has signed contract modification with the Boeing Company for five Saturn V first stages.

As a result of this action Boeing is now under contract to fabricate and assemble fifteen of the 7.5 million-pound thrust boosters, thereby completing the first-stage requirement for the previously announced scheduled launching of fifteen Saturn V space vehicles in the Apollo manned lunar landing program.

The $120 million supplemental agreement awarded by NASA's Marshall Space Flight Center extends the Boeing Contract through June 1970.

The incentive arrangement contained in the supplemental agreement covers cost, performance and schedule. This modification increases the total estimated value of the Boeing contract to $977 million.

Assembly of the first stage of the Saturn V is performed at NASA's Michoud Assembly Facility in New Orleans.

Performance Recognition

PRESENTATION—Flight Control Division employees recently received Sustained Superior Performance and Quality Step Increase awards. Seated, left to right, are Ted A. White, QSI; John B. MacLeod, SSP; William E. Fenner, SSP, and John T. Shone QSI. Back row: Flight Control Division chief John D. Hodge; Charles R. Lewis, SSP; Edward I. Fendell, QSI; Stephen G. Bales, SSP; Gary C. Watros, SSP; John A. Wegner, SSP, and Jackson B. Craven, SSP.

EVA Studies Contract Awarded NAA-SISD

North American Aviation, Space and Information Systems Division, Downey, Calif., has received a contract from NASA to study the requirements for an early extravehicular engineering activities program.

Future space exploration plans call for space crews to assemble large antennas, multi-faceted experiment packages and multi-element spacecraft in space.

Emphasis in this nine-month study is on early experiments to be performed in low earth or synchronous orbit. S&ID will examine the concepts the space agency has proposed for carrying out experiments in various fields — including astronomy, meteorology, earth resources, biology, long term flight, orbital operations and logistics, and research and development in advanced technology.

The study contractor will identify experiments and make recommendations on what is required to develop the capability in orbit. Requirements for various mobility systems—such as backpacks, jet shoes and maneuvering units—will be studied to determine the needs for moving the workman in space.

A portion of the study will be spent in selecting and defining experiments, selecting orbital support and ground support equipment, and research and development technology programming.

Results of the study are expected to contribute to the Apollo Application Program's orbital workshop experiment and other experiments. Otherwise the results of the study are being directed toward operational use in 1971-1973.

The NASA-Marshall Space Flight Center awarded the $245,000 contract and is directing the work.

With MSC-ers on the West Coast . . .

SERVICE AWARDS—Glenn W. Briggs, chief of RASPO-Downey Engineering Branch, receives a 25-year NASA Service Award and Ann Bilan, Office of the Resident Manager, receives a 10-year NASA Service Award from RASPO Manager of Advanced Projects R. H. Ridnour.

SUGGESTION AWARD—W. H. Gray, newly appointed manager RASPO-Downey, left, presents a suggestion award to Elmer Hardaway for suggestion submitted while both were in the Gemini Program Office-St. Louis.

Scientists, Engineers Get Pay Hike

The Civil Service Commission has increased the minimum salary rate ranges for positions in grades GS-9, 11, and 12 of all occupational series in the Engineering and Architecture Group, GS-800, and certain positions in the Science Series and Specializations including GS-1221, 1301.1, 1310, 1320, and 1520. Special rates previously authorized for these occupational series at grade GS-7 are not affected by this change.

The effective date of the increase was February 12, 1967, and will be reflected on pay checks issued March 3. As of this date, pay adjustments will be processed to increase the pay of current employees in the affected occupational classes. For example, the pay of an employee currently paid at the third step of GS-11, $10,166, will be adjusted to the third rate of the new step range, $11,111.

The revised rates are as follows:

	1	2	3	4	5	6	7	8	9	10
GS-9	$9,001	$9,262	$9,523	$9,784	$10,045	$10,306	$10,567	$10,828	$11,089	$11,350
GS-11	10,481	10,796	11,111	11,426	11,741	12,056	12,371	12,686	13,001	13,316
GS-12	11,306	11,685	12,064	12,443	12,822	13,201	13,580	13,959	14,338	14,717

Voyager Design Proposals Due In Early March

The NASA Jet Propulsion Laboratory has requested proposals from industry on contracts to conduct preliminary design and definition studies of the Voyager landing capsule.

Under current plans, two identical Voyager spacecraft will be launched aboard a single Saturn V launch vehicle to orbit Mars and make scientific studies. In addition, each will carry a landing capsule to study the Martian atmosphere and surface and to search for evidence of extraterrestrial life. The first Voyager flight opportunities are in 1973 and 1975.

JPL invited industrial firms to pick up the request for proposals on January 31. From the industrial proposals, due in early March, two to four contractors will be selected for preliminary design and definition studies.

Two additional procurement phases will follow the studies, system design and hardware development. A Voyager spacecraft, including landing capsule, is estimated to weigh some 20,000 pounds.

DEPOSIT AT FIRST LANDING—

Time Capsule 'Lunar Honor Roll' Honors Zero-Defect Apollo Work

Apollo program contractors met near Cape Kennedy yesterday to exchange ideas on Manned Flight Awareness—a program instituted in 1964 for the purpose of making workers conscious of the possible consequences of defects in flight hardware designed to carry flight crews.

The one day workshop was convened by NASA at Indian Harbor Beach, Florida for the purpose of reviewing activities initiated within its family of industry contractors to maximize hardware reliability through increased emphasis on employee orientation and motivation.

Highlighting the meeting was the discussion of a unique plan wherein a time capsule, containing the names of outstanding Apollo workers, will be deposited on the lunar surface by NASA's first landing party—thus paying high tribute to men and women throughout the nation who contributed to the program's success through exemplary work. When instituted this quarter, the plan will become known as the "Lunar Roll of Honor."

Each person within NASA, industry, the Department of Defense, and the scientific community contributing to the Apollo program, will be eligible to compete for the high honor of having his name carried on the lunar list. Nominations will be generated largely from within existing company employee incentive and motivation programs. These programs are known within the aerospace community by acronyms such as PRIDE, CARE, AWARE, and VIP.

Objectives of the NASA-coordinated Manned Flight Awareness program are essentially twofold: to instill in every person involved in the development of the nation's manned spaceflight capability a desire to do the best job humanly possible, and to develop throughout the NASA team a continuing awareness of the essential role of each individual in assuring mission success.

Manned Flight Awareness (MFA) had its immediate antecedent in the Mercury Awareness Program, which was an important part of the quality assurance program for the modified Redstone guided missiles used in the first manned flights of Project Mercury.

In April 1966, revitalization of the program was undertaken at the direction of Dr. George Mueller, Associate Administrator, Office of Manned Space Flight, Unlike industry zero-defects programs, Manned Flight Awareness emphasizes the prevention of human error not solely for the purpose of reducing scrap rates, rework and administrative costs, but rather as a means of reducing the risks to space crews which are inherent in the testing of new and complex vehicles. Savings that accrue in time and money in zero-defects efforts also accrue in Manned Flight Awareness, but they are considered bonuses rather than program goals.

Chairman of the workshop was Dr. James Turnock, Special Assistant (Programs) to the Apollo Program Director, Office of Manned Space Flight, NASA Headquarters. Dr. Turnock along with Mr. George White, Director of Apollo Reliability and Quality, will work with each of NASA's Manned Flight Awareness field offices to insure that the Lunar Roll of Honor serves to advance objectives of NASA in reducing crew risk and assuring mission success.

HITCH-HIKER—An Apollo boilerplate spacecraft dangles beneath an Air Force Aerospace Rescue and Recovery Service CH-53A cargo helicopter during tests at Ellington AFB to evaluate in-flight stability of the spacecraft-helicopter combination.

Helo Recovery Studied For Launch-Site Abort

NASA and the Department of Defense have concluded the first of three phases to evaluate the use of heavy-lift helicopters to support recovery of Apollo spacecraft.

The phase 1 tests were conducted at Ellington Air Force Base by MSC and the Air Force Aerospace Rescue and Recovery Service based at Orlando AFB, Fla.

The three-week series was to define equipment and spacecraft loads and to evaluate spacecraft stability in flight beneath a Sikorsky Aircraft CH-53A cargo helicopter.

When the test series is completed it will have demonstrated the practicality and effectiveness of using a heavy-lift helicopter such as the CH-53A for Apollo crew and spacecraft recovery in the immediate area of the launch site.

Once launch Complexes 37 and 39 at Kennedy Space Center, are operational, such support will be required because the launch site is surrounded by marsh, beach and surf areas not readily accessible to standard recovery equipment. Launch-site recovery would become necessary after a launch escape system (LES) abort from or just off the pad.

Also to be investigated in the later phases of the test program will be helicopter support of recovery in other possible landing areas.

NASA requirements in the test series include demonstration of a lift potential up to 14,000 pounds, man-rating of the sling system used to lift and carry the spacecraft beneath the helicopter, and capability to operate within launch constraints such as weather and darkness.

The spacecraft crew could, but normally would not, be recovered in the spacecraft. Nominal recovery plans call for two helicopters to be used, one to retrieve the crew—the primary goal of any manned mission recovery—and the other to pick up the spacecraft.

In the evaluation tests, NASA is responsible for design, fabrication, and equipment-vehicle interface of Apollo-unique equipment, DOD for the aircraft and crew, flight procedures, and deployment of the helicopters should they prove feasible for spacecraft recovery.

The MSC Landing and Recovery Division of Flight Operations Directorate is conducting the tests for NASA. Marion C. Coody, Operational Evaluation and Test Branch, is test conductor. Robert L. Tweedie, also from OE&T, is project engineer.

The 48th Aerospace Rescue and Recovery Sqdn., Eglin AFB, is providing the aircraft. Sikorsky test pilot Frank Tefft flys the helicopter.

Boeing Gets $1.8 Million Orbiter I Incentive Fee

The Lunar Orbiter Incentive Evaluation Board of NASA last month gave the Boeing Co., Seattle, a net award of $1,895,312 for the Lunar Orbiter I mission.

The Lunar Orbiter incentive contract between NASA and Boeing, the prime contractor, contains provisions under which the contractor could incur a fee reduction for late delivery of Orbiter spacecraft, and earn a reward on the basis of photographic data returned by the mission.

On the Orbiter I mission, the spacecraft was delivered by Boeing and accepted by NASA at Cape Kennedy, Fla., approximately one month later than scheduled, for which Boeing was assessed a reduction in fee of $100,000 out of a possible maximum reduction of $300,000.

For photographic data obtained by Orbiter I, the Board awarded Boeing $1,995,312.

The prime objective of the Lunar Orbiter I mission was to obtain through detailed photography, information on various types of lunar surface terrain in order to assess their suitability as landing sites for Apollo and Surveyor spacecraft and to improve our scientific knowledge of the Moon.

The performance award was based on the usefulness of the photographic data returned in meeting those objectives. The award of $1,995,312 compares with the maximum possible award of $2,573,333.

On its photographic mission, Lunar Orbiter I returned high quality pictures from its wide angle camera but its telephoto camera failed to return one-meter resolution pictures of the Apollo area of interest.

It returned photographic data on 16,000 square miles of candidate Apollo sites. It also took a large number of secondary photographs including 1.9 million square miles of the hidden side of the Moon.

One historic photograph from Orbiter I showed the Earth as viewed from the distance of the Moon.

Farewell and Well Done

LEADERSHIP RECOGNITION—Dr. Robert C. Duncan, left, former chief of the MSC Guidance and Control Division, January 27 was honored at a buffet luncheon attended by more than 50 managerial and supervisory people. Dr. Duncan recently accepted the position of Assistant Director for Guidance and Control Research at the NASA Electronics Research Center, Cambridge, Massachusetts. The citation on the plaque show being presented Duncan by Special Assistant to the MSC Director Paul Purser reads: "Presented to Dr. Robert C. Duncan in recognition of his outstanding technical and management leadership for the development of the Apollo guidance and control system by the Manned Spacecraft Center, Houston, Texas."

MR. GEMINI—Lockheed-Sunnyvale assembler John White, right, chats with Scott Carpenter, Lockheed Gemini Program Office Manager Larry Smith and Final Assembly Manager Art Logan in the Agena Target Vehicle assembly area. White, though due for retirement, refused to retire until all his Agena "birds" were out the door.

WANTED TO FINISH JOB—

Assembler Resisted Retirement

By Bob Jones

On July 23, 1966, John White retired from Lockheed Missiles and Space Company. He was 65 on that day and retirement is something the average person looks forward to. But, John White is not an average person.

He first came to work at Lockheed in 1943, and remained until 1946. In 1960, he returned to Sunnyvale as an assembler of precision and sheet metal, and was assigned to the Agena Target Vehicle program for Project Gemini.

This is where White showed he was very much out of the ordinary. He received seven Gemini Extra Care Awards and the Semi-annual Gemini Extra Care Award plus commendations for his work on Mariner C.

Then it came time for him to retire. But he wouldn't. He refused and made it clear to Lockheed management that the Agena was his "bird" and he was staying until they were completed. He said, "You can take the paycheck but don't take the badge. I'll come back and work anyway." Lockheed was quick to realize the special kind of man White was, and his retirement was postponed to allow him to finish work on Gemini Vehicle 5001 (which was successfully flown on Gemini XII, the end of the program.).

In all, he put in over 3,000 manhours on six Gemini vehicles without a single rejection tag. It was this performance and dedication that earned him the plant-wide nickname of "Mr. Gemini."

Scott Carpenter visited the Lockheed plant on May 26, 1966, and asked to meet White.

Commander Carpenter singled out White because, "Everyone I met at Lockheed had to tell me about John White: his coworkers were very proud of the man and the extra care he put into his work."

White is just one of hundreds of thousands of men and women working in the space program. His attitude and actions show that he is truly "aware" of the importance of his job. It is this kind of awareness by every person that is essential to insure fulfillment of the prime consideration of the manned flight program: the safety of the crew that flys the vehicle. John White and Lockheed already know this.

MANNED FLIGHT AWARENESS

Variable-Sweep Fighter Begins Tests at FRC

An F-111A aircraft to be used for research on variable sweep wing flight characteristics and performance was delivered in January to the NASA Flight Research Center, Edwards, Cal.

The airplane, the sixth built by the General Dynamics Corp., Fort Worth, Tex., is being loaned to NASA by the Air Force.

NASA will use the F-111 to obtain basic flight research data for the design and development of future advanced aircraft wings that move fore and aft along the fuselage. Aircraft of that type now under consideration include the Boeing 2707 supersonic transport (SST), Navy advanced fighter-attack (VFAX), and the advanced fighter (FX), advanced attack (AX), and advanced manned strategic aircraft (AMSA) for the Air Force.

The Air Force F-111A and the Navy F-111B, both variable sweep, are now in production, and a bomber version, FB-111A, is under consideration by the Air Force.

Research on variable sweep dates back to 1911. In 1960, NASA solved the basic instability problem by sweeping the wings simultaneously around separate pivot points located slightly outward from the wing roots, rather than from a single pivot inside the fuselage. Variation in the sweep serves to alleviate problems of stability, control and drag, and has important effects on the airplane's performance.

Factors to be studied by NASA include stability and control, handling qualities, flight loads and structural dynamic responses, inlet-engine integration, performance prediction, control systems, and operational characteristics. Data from the flight program will be used to validate theoretical and wind tunnel studies performed by the NASA Ames, Langley and Lewis research centers.

The flight operations are part of NASA's extensive effort in variable sweep research. Flight research with the operational F-111A will allow the disclosure and investigation of problems that cannot be predicted by other means.

Bell Aerosystems To Flight Test One-Man Vehicle

The NASA-Marshall Space Flight Center has awarded a $100,000 contract to Bell Aerosystems, Buffalo, N.Y., to flight test a one man flying vehicle which the company has developed.

Bell Aerosystems is to study how the system—sometimes called a "pogo stick"—reacts in a variety of situations. The vehicle will be tested in a one-sixth gravity facility at the Langley Research Center, Hampton, Va. This is a six month study.

In this flying system, the pilot stands on a cross bar. The propulsion system, which uses hydrogen peroxide as fuel, is controlled by handle bars.

FAMILY PRECAUTIONS—

Stray Animals Can Be Sources Of Rabies, Tetanus Infections

By MSC Safety Office

Many times a child who sees his pet struck by a vehicle will rush to aid the animal—this is a normal reaction. They should be taught to surpress this urge, for many times the animal will bite and hold on to anything that touches it. There is always the possibility of rabies, and infection of tetanus from a wound, and can certainly cause the child to fear and dislike animals.

Family precautions should include tetanus immunization and rabies shots for pets. Rabies and tetanus are two serious illnesses that can be transmitted to man be the bite or scratch of any infected mammal from the tiniest shrew to the largest carnivorous animal.

No Tetanus Cure

Because there is no cure for tetanus once it has entered the nervous system prior immunization is the best protection. The standard tetanus series for adults consists of an initial shot, another a month later, a booster a year and then a booster each four years. A child's immunization differs in that an extra shot is administered on the third month and the effectiveness lasts only two years.

Tetanus, commonly known as lockjaw, results from the poison released from an organism that thrives on the lack of oxygen.

So powerful is this poison that 1/4 teaspoonful can kill 100,000 people. These tetanus organisms are found in almost every soil sample. Many people even harbor these germs in their intestines with no ill effects. Soil that has been treated with animal fertilizer is likely to be very rich in the germs.

Infection can occur through any penetration of the skin from a bite, or a scratch. Sometimes germs will enter a wound, remain at the site of the entry for weeks, months and even years.

Frequently, a tetanus case will show no physical sign of a wound. Normally the effects of tetanus does not become apparent for five to seven days; however, some cases incubate in only a few days. Generally, the longer the incubation period, the less severe the illness.

Estimates indicated that of the three to five day incubation periods, 100 percent die, of the five to seven day incubation periods, only 10 to 20 percent can normally be expected to recover.

Two Rabies Types

Rabies, alias hydrophobia, is another illness that attacks the nervous system. There are basically two different types of rabies, the furious and the dumb. These names are derived from the behavior of the infected animal.

In the furious type, the animal will be moody, either desiring to be left alone or extremely friendly. This moodiness is always followed by a period of wandering and irritability in which the animal bites other animals, sticks, people and even his master.

The dumb rabies is characterized by drowsiness, disinterest in everything and a limp slack jaw. Frequently animals with both types of rabies will sit over a pail of water or will try to drink by immersing over half its head in the water. These symptoms are certainly only indications that a animal may have rabies.

If one suspects that a dog, cat or other animal may have rabies, it should be taken to a veterinarian immediately for diagnosis.

The greatest occurances of rabies is during the summer however, if an animal is bitten by a suspected animal, it should be confined and treated for at least 30 days whether it has been vaccinated or not.

If family member is bitten by an animal, the following steps should be taken:

- Identify the animal, by kind, size, color and place. Teach children to seek the help of a policeman, school guard or an adult as soon as possible.
- Clean the wound thoroughly as quickly as possible with warm water and soap for at least fifteen minutes. This will greatly decrease the chance of contracting rabies.
- See a doctor immediately after washing the wound for a determination of whether or not to start the rabies treatment. This treatment now consists of 14 consecutive daily injections.
- Report the incident to the local health officer in Harris County phone CA 8-8311, or in Houston phone CA 2-9351 and to the dog pound (in Houston phone CA 2-9351).
- Have the biting animal quarantined for ten days. If it is normal after this period it is probably not infected. The exception to this is the infected bat which may live for months.

Each year over 600,000 people are bitten in the United States, of these 60,000 require the anti-rabies treatments. The best advice for the individual is to stay away from strange domestic animals and wild animals.

Ames Scientists Isolate Unearthly New Material

A new extraterrestrial mineral has been analyzed and named by scientists at NASA's Ames Research Center near San Francisco, California.

The new mineral, which does not exist on earth, has been named Niningerite by Doctors Klaus Keil and Kenneth Snetsinger, Ames geochemists. They have identified several varieties of the compound in six meteorites.

The mineral was named for Dr. H. H. Nininger of Sedona, Arizona, for his outstanding contributions to meteorite work.

Clue to Origin

Meteorites are the principal source of extraterrestrial material available on earth. The minerals in meteorites provide clues to the origin and history of the solar system.

Presence of the new substance in a meteorite, and its composition, has been noted previously as part of other work by three scientists: Dr. Paul Ramdohr, working alone in Germany; and Doctors Kurt Fredriksson in the United States and Frans E. Wickman in Sweden, working as a team.

The Ames electron microprobe analyses are the first studies of all the Niningerite available in the world's meteorite collections, and the first measurements indicating its significance to space geology.

The new extraterrestrial mineral is a combination of iron, magnesium, and sulfur, and is described as an iron-magnesium sulfide. Doctors Keil and Snetsinger made all the finds of the mineral in enstatite chondrites, a class of stony meteorites. Variations in concentration of iron and magnesium in the Niningerite found in the six meteorites suggest various geologic histories for these meteorite rocks. A paper on this work was published in a scientific journal last month.

Opinions Vary

Many scientists believe that meteorites come from the asteroid belt, the ring of small bodies orbiting the sun between Mars and Jupiter. Other scientists place their origins variously in comets, the moon, or the Martian moons.

Most stony meteorites, including the enstatite chondrites, are estimated to be about 4.5 billion years old. This is also the most common age now calculated for the earth. This would mean that formation (cooling from the molten state) of these meteorite rocks took place about the same time as formation of the earth.

The meteorites also are the oldest rocks we have—about one billion years older than the oldest rocks so far found on earth. Meteorites are believed to be the closest available material to the primordial material which formed the solar system.

Unlike meteorites, the original rocks of the earth have been remelted one or more times (turning them into new rocks) as a result of the great internal heat and pressure in the earth.

Studies at Ames and elsewhere of the "slow-cooling profile" of iron meteorites indicate that these objects come from portions of orbiting bodies no deeper below the surface than 150 miles. This is "close to the surface" by earth standards, but far deeper than material can be obtained from within the earth itself.

"If you accept the reasoning that stony meteorites do come to earth from the asteroid belt," says Dr. Keil, "then these may be rocks which formed early in the evolution of the solar system and have remained in solar orbit ever since. They may be rock fragments which have come to earth following collision and break-up of two or more asteroids."

Hydrogen Rich

The Ames analysis suggests that Niningerite almost certainly was formed in an environment rich in hydrogen. The sun is 80 percent hydrogen by mass, and most scientists agree that the solar system (and probably all planetary systems) condensed from clouds made up principally of hydrogen.

The samples of Niningerite appear to have undergone very little heat and pressure change since their original formation. Dr. Keil has found small changes due to heating, such as growth of new crystals and loss of rare gases.

The fact that these minerals have been reheated little since their original cooling suggests that they have never been far below the surface of an orbiting body.

Niningerite containing relatively more iron than magnesium appears to have undergone more heating than that with less iron and more magnesium. This suggests that the iron-rich mineral comes from farther below the surface of its parent body than the magnesium-rich form.

Other stony meteorites (enstatite chondrites) which appear to have been heated to high temperatures and for long times within a parent body do not contain Niningerite, Dr. Keil reports. However, Niningerite originally may have been present, but was burned by heating into other sulfides containing more manganese and less magnesium and iron.

Niningerite was analyzed with an electron microprobe, a device which determines chemical composition of material by bombarding it with an electron beam.

The enstatite chondrite meteorites studies by the Ames scientists were found at Abee, Canada; Satin Sauveur, France; Adhi-Kot, Pakistan; Indarch, USSR; St. Marks, South Africa; and Kota-Kota, Malawi (Africa).

Top Hands Around the Old Charm Club Corral

GO WEST, YOUNG LADY!—And members of the MSC Charm Club did go west, or at least Texan, February 8 when the club held a Go-Texan Style Show at the Nassau Bay Motor Hotel. It is not known how a herd of whiteface would react to the shimmering saddle togs worn by Wanda Slack in good-guy white hat, top left, and Helen Patterson, center, but we suspect these duds were intended more for the cowgirl who rides the range in a helicopter. Though not part of the show, Mary Ann Kelley told the other side of the cowboy-Indian story with her fringed squaw outfit. But who ever saw a blonde squaw? In the bottom photo, others who went Texan are, left to right, Helen Patterson, Wanda Slack, Helen Gregory, Nina Meier, Hazel Edge, Suellyn Johnson, Mary Jane Penzo, Ann Brenton, Phoncille DeVore, Marie Stokey and Ann Hardeman. (Photos by Jack Jacob)

ESSA IV Nears Operation Status With Transfer

NASA turned over the ESSA IV weather satellite to the Environmental Science Services Administration (ESSA) of the Department of Commerce for operational use at noon February 8.

The 290-pound satellite will now be controlled by ESSA, in accordance with an agreement between the two agencies.

Since ESSA IV was launched from the Western Test Range in California, January 26, NASA engineers have been checking out each system in the operational satellite. The only problem has been a shutter malfunction in the automatic picture transmission system (APT) camera. Attempts to get the camera working properly have been unsuccessful.

However, ESSA IV carries an extra, or redundant, camera which can provide complete photo coverage of the world's cloud cover.

The ESSA IV satellite APT camera sends instant, or "live" meteorological pictures to small ground stations anywhere in the world. APT stations are situated on all continents.

The operational weather satellite's orbital elements are apogee of 894 miles, perigee of 822 miles, and period, 113 minutes.

SHARED GRIEF–

Expressions of Loss in Verse Reach MSC From Over Nation

The flash fire in Apollo 204 spacecraft which took the lives of crewmen Virgil I. Grissom, Edward H. White II and Roger B. Chaffee has prompted many people around the country to set down their thoughts and feelings in verse.

While the meter of the poems may not always scan to the satisfaction of a literature professor, there is no doubt that the poems express the feeling of loss not only to the space program but to those who vicariously share the exploration of space by NASA flight crews. Some were scribbled, some were neatly typed.

Reproduced below are a few examples of verse received at MSC.

On Wings of Space

A nation mourns,
Its fallen heroes lifeless lie
The victims of a monstrous tragedy.

A blinding flash
Releases instantly
Immortal souls;
And Heaven trembles at the awesome sight
Of valiant men
The sacrifice of love for fellow men
Ascending swiftly golden stairs
To place of honor before the throne of majesty.

Weep no more!
The glorious flames
Shine brightly on eternal shores,
Their beacon guides us onward
To fulfillment of arduous task.

–Jennie Kukanich
Tempe, Arizona

To Virgil Grissom, Ed White, Roger Chaffee

Achieving more than other men,
To help mankind they did intend
To better life, improve the world,
Themselves into outer space they hurled

Astronauts, first of their kind,
Venturing forth truths to find.
Truths that Earth and space
By God were designed.

–C. W. Kent
San Antonio, Texas

The Wide and Starry Sky

(Dedicated to the memory of Gus Grissom, Ed White and Roger Chaffee)

The stars still shine, like distant shores,
And beckon the mariner to taste their wine;
To plant his feet upon their sands,
To rest his soul in a strange, new land.

Three had turned their vision upwards,
Into the wide and starry sky;
Their goal a yellow jewel,
A new world for man to know.

Further still they turned their gaze,
Into the cold, black void,
To a ruby world of mysteries,
To a pearl with a hidden face.

And further still their vision roamed,
To a million diamonds that reached tomorrow.
Here they knew the future lay,
Here they knew they had to be.

They had soared to the limits of the sky,
And two had gone beyond.
Now they began to chart the way
To the edge of the velvet night.

Into the wide and starry sky
Their course was set and steered.
They plunged directly into the night,
And never stopped to wait for light.

The stars still shine, like distant shores,
And beckon the mariner to taste their wine,
To plant his feet upon their sands,
To rest his soul in a strange, new land.

–George Adcock
Lynchburg, Virginia

In Memory of Our Astronauts

Our courageous astronauts paid
The supreme price on the altar of space.
Progress. Because of this sacrifice,
Spacefarers of the future will now
Venture on their journey to the stars
More safely in the search for knowledge
Of our universe.

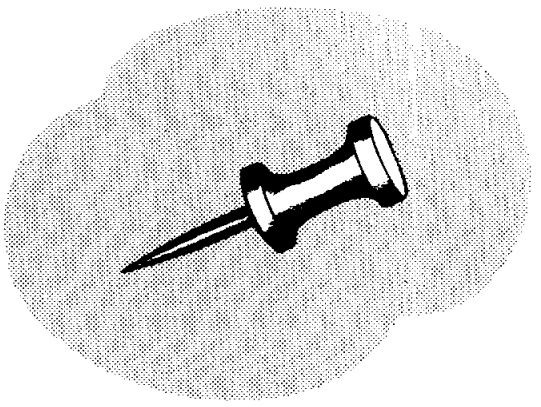
Progress is the necessary ingredient
In today's events, that mankind of
The future may live in a better world.

It is not in vain, that one gives up
His life for his fellow man. Though our
Hearts are filled with grief and
Saddened by sorrow, it is now our
Solemn duty and obligation to . . .
Carry on!

–Rex Trowbridge
Sisters, Oregon

HE THAT WILL NOT
STOOP FOR A PIN
WILL NEVER BE
WORTH A POUND

ENGLISH PROVERB



COST REDUCTION

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Public Affairs Officer . . . . . Paul Haney
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Space News Of Five Years Ago

February 20, 1962 – Mercury-Atlas 6 was launched from Cape Canaveral with John Glenn as pilot. The Friendship 7 spacecraft covered its three-orbit flight in 4 hours 55 minutes and 23 seconds. Some 60 million persons viewed Glenn's launch on live television. During the flight two major problems were encountered: 1. a yaw attitude control jet apparently clogged, forcing the pilot to abandon the automatic control system for the manual-electrical fly-by-wire system and the manual-mechanical system; and 2. a faulty switch in the heatshield circuit indicated that the clamp holding the shield had been prematurely released–a signal later found to be false. During reentry, however, the retropack was not jettisoned but retained as a safety measure to hold the heatshield in place in the event it had loosened. The spacecraft landed in the Atlantic Ocean about 800 miles southeast of Bermuda and was recovered by the USS *Noa* after being in the water for 21 minutes. With the success of MA-6 the basic objectives of Project Mercury had been reached–a man put into earth orbit, his reactions to space environment observed, and his safe return to earth to a point where he could be readily found. Prior to the flight, there was concern about the physiological effects of prolonged weightlessness. To the contrary, there were no debilitating or harmful effects, the pilot found the zero-g conditions very handy in performing his tasks, and felt exhilarated during his 4½ hours of weightlessness. One of the interesting sidelights of the Glenn flight was his report of "fireflies" when he entered the sunrise portion of an orbit. For some time this phenomenon remained a space mystery, until Scott Carpenter accidently tapped the spacecraft wall with his hand, releasing many of the so-called "fireflies." The source was determined to be frost from the reaction control jets.

President Kennedy made a statement to the press on the lawn of the White House, expressing the "great happiness and thanksgiving of all of us that Colonel Glenn has completed his trip . . . "I also want to say a word for all those who participated with Colonel Glenn in Canaveral. They have faced many disappointments and delays–the burdens upon them were great–but they kept their heads and made a judgment and I think their judgment has been vindicated.

"We have a long way to go in this space race. We started late. But this is the new ocean, and I believe the United States must sail on it and be in a position second to none.

"Some months ago I said that I hoped every American would serve his country. Today Colonel Glenn served his, and we all express our thanks to him."

February 23, 1962 – In NASA press conference at Cape Canaveral John Glenn described his three-orbit flight. He related his observation, his pilotage during almost two orbits, and his concern when burning fragments of the retropackage during reentry appeared to indicate to him that the heatshield was breaking up. He referred to weightlessness as a "very pleasant" sensation to which he is becoming "addicted."

In earlier ceremonies at Cape Canaveral, President John F. Kennedy awarded the NASA Distinguished Service Medal to John Glenn and MSC Director Robert R. Gilruth.

February 25, 1962–Factory roll-out inspection of Atlas launch vehicle 107-D, designated for the Mercury-Atlas 7 manned orbital mission, was conducted at Convair.

February 26, 1962 – John Glenn Day in Washington, D.C., featured the reception of the MA-6 pilot at the White House, a parade, and his address to a joint session of Congress.

March 1, 1962–An estimated four million people lined the streets of New York City for "John Glenn Day." Mayor Robert Wagner presented Glenn and Robert R. Gilruth the city's Medal of Honor.

March 2, 1962–The seven Project Mercury pilots were guests of the United Nations, and John Glenn acted as spokesman during an informal reception given by acting Secretary General U Thant.

ROUNDUP
EMPLOYEE NEWS

Driller Speaks At ISA Meeting

John M. Payne, senior staff engineer with the Shell Development Company, will be the featured speaker at the February 23 meeting of the Apollo Section of the Instrument Society of America. He will discuss the role of instrumentation in the oilfield.

Payne has been with Shell for 23 years in the Denver and Houston areas in drilling and production operations and has been involved in various phases of offshore drilling. His talk will cover the application of electronics and general instrumentation to these operations.

The meeting will be held at the Holiday Inn on NASA Road 1, and non-ISA members are welcome to attend. The meeting begins with cocktails at 6:15 pm, dinner ($3.50/person) at 7:15 and the program at 8.

For reservations call Karen Dolch at HU 8-1270 Ext 397, or Pat Todsen at HU 8-0900.

MSC Judo Club Offers Means of Keeping Fit

The MSC Judo Club offers for desk-bound engineers and administrative types a way to cut down on that swivel-chair bulge—keeping fit through regular exercise and training in the Japanese sport of judo. Not only does judo become a useful skill, but a survey of MSC Judo Club members reveals that not one member had sand kicked into his face at the beach last summer.

The MSC Club was begun at Langley AFB, Virginia and still has some of the original members. The Club is associated with the Armed Forces Judo Association, the Judo Black Belt Federation and the YMCA. Only *Kodokan* judo is taught—a sport form of judo and not strictly self-defense.

Workouts are held each Tuesday and Thursday from 5:30 to 7:30 pm at the Clear Lake City Gymnasium. Saturday and Sunday workouts are also held concurrent with matches against other clubs.

The Club's chief instructor is Marine S/Sgt Jim Giles, holder of the 3rd degree Black Belt, former All-Marine champion and team coach, and who attended Olympic trials.

MSC Judo Club members, their monikers and judo belts they hold are as follows:

John *Banzai* Llewellyn, 1st degree Black; Manfred "Dirty Dutch" von Ehrenfried, 2nd degree Brown; Gene "Killer" Kranz, 3rd degree Brown; "Kit Carson" Cantrell, 3rd degree Brown; Bill "Kato" Moon, 3rd degree Brown; Dick "Super Kick" Stachurski, Green; Tom "Murderous" Murtagh, Green; Dale *Ogaruma* Morris, Green; Mac *Taio* McCarty, Green; John "Rib Crusher" Hatcher, White; Jerry "Uh-Oh" Balcom, White; Rand "Nasty" Nichols, White, and Jerry "Limpy" Lowe, White.

For further information about MSC Judo Club adult and children's classes, call von Ehrenfried at 2337 or 591-4163.

WHUMPF!—MSC Judo Club instructor Jim Giles demonstrates for John Llewellyn the fine points of the judo throw *uchi-mata*.

IN-FLIGHT FLIGHT DIRECTOR—Flight Director Gene Kranz gets the business from Manfred "Dutch" von Ehrenfried with a judo throw called a *kata-garuma*.

Lunarfins Course Planned for Divers, Would-Be Scubas

The MSC Lunarfins club is planning a swimming course with a dual purpose: for divers who want to learn to swim better and for people who swim but want to swim well enough to learn to use Scuba gear.

Instruction will start at or above the Red Cross intermediate level and progress through the "swimmer" and "advanced swimmer" levels as rapidly as student abilities allow.

Tentatively scheduled to begin February 20 at 7 pm at the Tropicana Swim Club, the course will be taught by a certified Red Cross Water Safety Instructor, and Red Cross certificates will be issued upon completion of the course.

For registration and further information, call Mary Ferguson at 3201.

Volleyball League Forms

The 1967 MSC/EAFB Volleyball League will hold its first meeting March 10 at 6 pm at the Ellington AFB NCO Club. To enter teams in the volleyball league schedule, call Ray Southers at 3241.

Program Helps Grad Students

One hundred and fifty-two colleges and universities will participate in the NASA graduate training program during the 1967-68 academic year.

Seven hundred sixty-four graduate students will begin work toward their doctoral degrees in one of the space-related disciplines in colleges and universities located in every state of the union. In September 1967, a total of 3,370 graduate students will be receiving support under this program.

Although at a reduced level from last year, the training program continues with the principal objective of helping to meet the nation's future needs for highly-trained scientists and engineers. The program also is designed to enhance the competence of universities to participate in and make important contributions to the national space program.

The predoctoral training program is one phase of NASA's activities involving participation by the nation's colleges and universities in research and development in space. It is administered by the Office of Grants and Research Contracts of NASA Headquarters.

1967 MSC/EAFB Basketball League

Standings as of February 10

American Division			National Division		
TEAM	WON	LOST	TEAM	WON	LOST
MPAD/RAB	6	0	USCG	6	1
FCD	6	0	PHILCO	6	1
P&PD	5	1	UNIVAC	6	1
IBM (Blue)	5	1	IBM (G)	5	1
TRW	5	2	LINK	4	2
ANG	4	3	IESD/LEC	4	3
NAA	3	3	LRD	3	3
ASPO	2	5	G&CD	2	4
747th	2	5	MPAD	2	4
CSD	2	5	GRUMMAN	2	5
ISD	1	5	MI	1	5
FSD	1	5	FCSD	1	6
CAD	0	7	MPAD-HAWKS	0	6

The EAFB Invitational Basketball Tournament will be held on Saturday and Sunday, February 25 and 26 at the EAFB gym. Games on Saturday start at 9:30 am and on Sunday at 1:30 pm. Participating teams are the top teams of the MSC-EAFB league, the military teams at EAFB and the top teams of the Pasadena City League. No admission charge.

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—REAL ESTATE

2-bdr 1½-bath '65 Melody Home, center kitchen, plenty cabinet space. $1000 equity, pick up $66/mo payments. Poenisch, Ext 2381 (no home phone).

4/2½/2 in Clear Lake City, fenced, landscaped, 2300 sq ft, separate dining and family rooms, extras. Assume 6% $23,300 loan with $4500 equity. James W. Gray, HU 8-0415.

FOR SALE—AUTOS

1955 Buick Special, autotrans, blue and white, new tires, rebuilt transmission, dependable work car. $200. Lenora Patterson, 495-3389 Mont Belvieu, Texas.

1964 Pontiac station wagon, assume $1900 Credit Union balance. Luther Palmer, 877-1269.

1962 Pontiac Bonneville, 44,000 actual miles, one owner, new tires. Matt Quinn, HA 4-2489.

1965 Chevy 4-door sport sedan, factory air, pwr steering, AM radio, stereo tape, V-8 autotrans, light green, 29,000 miles. $2000 cash. Michael M. Thomas, 8308 Gulf Freeway Apt 57, MI 3-2622.

1965 Mustang V-8 289, xclnt condition, one owner, air, special 2-tone interior, nearly new tires, will take $100 less than current Blue Book price. Herb Tash, Dickinson 534-3414.

1965 Comet Cyclone, AM/FM, bucket seats with console, air, pwr steering/brakes, timed wipers, emergency blinkers, floor mats, tachometer, clean. Hal Hunt, Kemah 877-1377.

1959 Pontiac 9-passenger station wagon, one owner, full power, 65,000 miles, xclnt condition. $550. Bill McConnell, HU 4-5680.

FOR SALE—MISCELLANEOUS

Zeiss Ikoflex I twin-lens reflex camera, shoots 12 2¼x2¼ pix on 120 film, f/3.5 Zeiss Novar lens in Compur shutter, ever-ready case. $25. Terry White, 932-4472.

1966 Ducati Motorcycle, 160cc, 70-75 mph, 90 mpg, 1500 actual miles, xclnt condition. Also helmet, tinted bubble, cable lock w/keys tarpaulin $300 for all. J. M. Walker, RI 8-5910.

Replica of cap-and-ball dueling pistol and mold, xclnt condition. $39.95. Japanese 7.7mm rifle, satisfactory hunting rifle, make boy good birthday gift. $10. Charles Shoemake, 591-3300 Ext 3182 or HU 2-7874.

1965 Honda Super 90, torque cam, special ignition, low mileage, black and silver. $300 or trade for 55-58 Chevy. Helen Statz, HU 2-7607 after 6.

1967 Honda 305 Super Hawk, treated with TLC, xclnt condition. $665. John Hirasaki, MI 9-1800.

Ercoupe, 480 hours since major overhaul on Continental 85-hp engine, Forney cabin, good fabric, full paint, metal prop, Narco VC-27Z, rudder pedals. $2195. Gary Hanisch, 534-4493.

Six registered standard poodle puppies: four black females $50 each, two black males $65 each. Available March 1. Lynn Gripon, 932-3256.

Guild electric guitar and speaker triple pickup, 5 controls $140; 10-ft wood step-ladder $10; baby crib with spring $15; baby dressing table $10; single bed w/mattress $15. John Fitzgerald, 932-4155.

11x17-ft beige nylon continuous-filament rug, rubber pad included, xclnt condition. $50. Harvey Hartman, HU 8-2754.

Registered sable-color Shetland Sheep Dog (Toy Collie) puppies. Ideal child's pet. D. Greenwell, HU 8-1034.

Thoroughbred black quarterhorse mare, 5 years old, not for child, registered, dogging-type saddle. $600. Lenora Patterson, Mont Belvieu 495-3389.

WANTED

Car pool or will pay from 2607 Cedar Drive, La Marque to Bldg 419, 7:30 a.m. to 4 p.m., Evelyn Villeneuve WE 5-3878.

Female roommate to share Bayhouse apartment, 2-bdr 1½-bath, 2 carports. Connie Critzos, HU 8-2193 days, NB 591-2271 after 5:30.

Ride from Bldg 1 to Texas Avenue in League City two or three afternoons each week at 5, Thursday and Friday. Jane Beacom, 932-3077.

Car pool from Baytown to Bldg 4 7:30 to 4. LeAnne Bible, Ext 3606 (no home phone).

Used "Dobro" guitar, James R. Bates, HU 4-4687.

Several people to share in car pool from LaPorte 8:30-5. Jana Baker, GR 1-2084.

Book Loan Extended

The MSC Technical Library has extended to three weeks the loan period for circulating books, but without renewal privileges that existed under the old two-week loan period.

The policy change was made to simplify loan procedures for the Library staff and to better serve users.

TO COLD TO HANDLE—Jack Goodman and James MacBenefield of Brown & Root-Northrop check the effects of rapid transfer of liquid nitrogen from one vessel to another as a part of the 20-hour safety course on the handling of compressed gases and cryogenic liquids conducted by the MSC Safety Office. Other demonstrations included the effects of liquid nitrogen on various materials and quick-freezing of lettuce leaves.

VALVE JOB—Safety course guest lecturer William White of Black, Sivalls & Bryson, Inc. demonstrates the function of a burst-disc relief valve to Ross Workman of North American Aviation, Clyde Hood of Philco-Ford and MSC Assistant Fire Chief M. A. McWilliams.

Safety Office Conducts Gas Handling Course

Selected MSC and contractor support employees successfully completed a 20-hour safety course between January 30 and February 10 in "Compressed Gases and Cryogenic Liquids." This is probably the first time that such a combination course has been offered at MSC.

The training program was specifically designed to assist engineers, technicians, and laboratory operators to more effectively and safely handle compressed gases and cryogenic liquids at MSC.

Using the composition of the atmosphere as a springboard, the course treated compressed gases and their liquid counterparts, the ultra-cold cryogens, used at MSC. Oxygen, nitrogen, hydrogen, helium, carbon dioxide, and the rare gases were treated extensively, primarily from a safety point of view.

Initially requested by the Chief, Crew Systems Division, the course was conducted under the auspices of J. E. Powell, who heads the MSC Safety Office. Edwin Logan developed the course with technical assistance furnished by William T. Kitts, Space Environment Simulation Branch of the Structures and Mechanics Division. Kitts also served as the main instructor for the training program, attended by 13 employees.

Industry furnished much of the training material used, including multi-sensory materials of instruction and several guest lecturers.

CU Depositors Get Free 1-for-1 Life Insurance

Money saved in the MSC Federal Credit Union has double its value, for each dollar saved before age 55 is matched with a dollar of life insurance up to a maximum of $2000.

No applications or physical exams are required for the coverage and there is no premium to pay each month. The life insurance remains in force for as long as the savings remain in the Credit Union.

Savings deposited between ages 55 and 70 earn life insurance coverage in lesser amounts, depending upon the depositor's age on the effective date of the contract or when he makes subsequent deposits.

When a Credit Union depositor dies, his heirs get not only the savings in his account, but also the insurance coverage earned by the account.

For additional information about the advantages of saving the MSC Credit Union way, call the Credit Union office at 2066.

Contract Signed For S-IVB Items

NASA has signed a $6,383,720 contract with the Missile and Space Systems Division of Douglas Aircraft Company for long leadtime items for the S-IVB upper stages of the Uprated Saturn I vehicles. Managed by the Marshall Space Flight Center, the contract will extend through June, 1967.

The contract extension is aimed toward maintaining the option of ordering additional S-IVB stages in the future without suffering a delay in certain areas where considerable time is required for acquiring materials or for manufacturing. A similar separate action was earlier taken in the Uprated Saturn I first stage program.

NASA Awards Mars Mariner Power Contract

NASA has awarded to Electro Optical Systems, Inc., Pasadena, Cal., a contract for the design, fabrication and testing of the power subsystem for the unmanned Mariner mission to Mars in 1969.

Award of the contract, valued at approximately $2 million, completes the selection of contractors for procurement of major subsystems for the two-spacecraft mission.

The Jet Propulsion Laboratory manages the Mariner Mars 69 project for NASA.

Contracts for nine other Mariner subsystems were awarded to seven industrial firms during the latter half of 1966. They are:

- Engineering mechanics subsystems (structure, mechanical devices, temperature control and cabling subsystems) — Northrop Systems Laboratories, Northrop Corp., Hawthorne, Cal.;
- Telemetry and data storage subsystems — Texas Instruments, Inc., Dallas.
- Radio subsystem — Philco Corp.'s Western Development Laboratories, Palo Alto, Cal.;
- Attitude control and scan control subsystem—Honeywell, Inc., Minneapolis;
- Central computer and sequencer, and command subsystems — Military Electronics Division of Motorola, Inc., Scottsdale, Ariz.;
- Data automation system — Guidance and Control Systems Division of Litton Industries, Inc., Woodland Hills, Cal.;
- Approach guidance subsystem—Electro Optical Systems, Inc., Pasadena, Cal.

During January JPL selected TRW Systems, Redondo Beach, Cal., for negotiations for the design modification, fabrication and testing of the propulsion subsystem. Finalization of the contract is expected in February.

ROUNDUP SECOND FRONT PAGE

Dr. Hess Appointed

(Continued from page 1)

Operations. Divisions are Space Physics, and Lunar-Earth Sciences.

Dr. Hess has been chief of the Goddard Theoretical Division since 1961. He came to Goddard from a post as chief of the Plowshare Division of the University of California's Lawrence Radiation Laboratory at Livermore, which he held from 1959 to 1961.

His scientific interests have included high-energy nuclear physics, neutron scattering, cosmic ray neutrons and major studies of the Van Allen radiation belts.

From 1956 to 1959, Dr. Hess was at the University of California laboratory at Berkeley, prior to which he had been a group leader in experimental hydrodynamics at Lawrence Radiation Laboratory from 1954 to 1956. He also had a tenure as an instructor of physics at Oberlin College, Ohio.

Born at Oberlin, Ohio, in October 1926, Dr. Hess obtained his Bachelor of Science degree at Columbia University, N. Y., his Master of Arts Degree from Oberlin College in 1949 and Doctor of Philosophy Degree from the University of California, 1954.

Dr. Hess is a member of the American Geophysical Union, the American Physical Society, the American Association for the Advancement of Science and the Washington Philosophical Society. He is an associate editor for five scientific journals, *The Journal of Geophysical Research, The Journal of Atmospheric Sciences, Space Science Review, The Review of Geophysics* and the *AIAA Journal.*

He served as editor of the recently-published volume, *Introduction to Space Sciences.*

Dr. Hess and his wife, Mrs. Winifred Esther Hess, have three children: Walter, 9; Alison Lee, 8; and Carl, 6. They presently reside at Silver Spring, Maryland.

MSC Employees Conduct Scout Firearm Course

Three Clear Lake area Boy Scout troops are receiving instruction in a hunting and home firearms safety course at Camp Strake near Conroe. More than 100 boys from troops 95, 795 and 895 in Seabrook are taking the course, which includes demonstrations of firing of authentic Civil War pistols and rifles.

The course is sanctioned by the National Rifle Association and the boys will receive NRA awards upon completion of the course.

Among MSC employees acting as instructors or Scoutmasters are Jim Donnell, course director; Terry Heil and Tom Larkin, rifle instructors; Merle Schwartz and Don Bray, shotgun instructors; Ken Kleinknecht, shotgun instructor and instructor in calling, dressing and recognition of game.

Gene Allen, Bill Douglas and John Mullins, demonstration and safety instructors; Dewey Hydrick, president of Pearland Gun Club furnishing demonstration rifles; Chuck Wheelwright, Troop 95 Scoutmaster; Bob Spann, Troop 795 Scoutmaster; C. O. Standish, Troop 895 Scoutmaster, and Maynard Dalton, Troop 95 Assistant Scoutmaster.

Contractor employees taking part in the course are Bob Block, Philco, chief rifle instructor, and Don Hall, North American Aviation, Troop Committee Chairman and Troop 895 Assistant Scoutmaster.