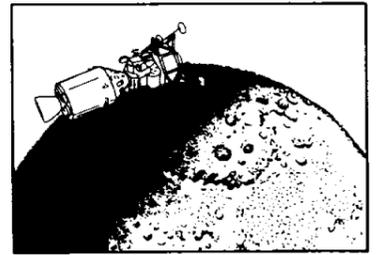


ROUNDUP



NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS

VOL. 6, NO. 14

APRIL 28, 1967

Lunar Ditch-Digger



SOIL TESTER—Portions of two Surveyor III photos are combined to show (top) the surface sampler after it has been pushed down into the lunar surface, and (bottom) the depression left in the lunar soil after the remote-control shovel had been withdrawn. Surveyor III landed on the moon at 6:04 pm CST April 19 after a 65-hour flight from Kennedy Space Center.

BEYOND APOLLO—

MIT Named to Develop Long-Range Guidance

MSC has awarded a \$500,000 contract to Massachusetts Institute of Technology, Cambridge, Mass., for the study of an advanced control guidance and navigation system for long-range manned missions beyond Project Apollo.

Under the terms of the contract, the Division of Sponsored Research of MIT will study, develop, and test advanced guidance and navigation techniques to support extended manned missions from 28 days to a year or more. MIT will provide the necessary technical skills, services, and materials to accomplish this development program.

Specifically, MSC is looking for a guidance and navigation system which will perform efficiently many diverse tasks for many changes in spacecraft module configuration.

Long duration missions make it necessary to develop equipment which operates on less electrical energy and places fewer demands on the environmental control system. Also, extended mission spacecraft should be able to make navigation measurements without the rigid constraints imposed on spacecraft attitude.

The contract calls for MIT to

develop and demonstrate, via laboratory tests, an advanced G&C technique which will minimize spacecraft constraints, enhance mission flexibility and eliminate the mission-time dependency of G&C system reliability, while maintaining adequate performance to accomplish mission requirements.

MIT will organize the study into four major task areas: System Integration, Computer Design, Inertial Sensors, and Optical Systems.

- System Integration will insure the overall physical and operational requirements for advanced manned mission G&C are defined and met.

- Inertial Sensors development will provide inertial sensors to meet G&C requirements for the next five years.

- Computer Design will provide the studies necessary to establish the structure of an advanced spacecraft computer subsystem.

- Optical Systems Development will provide optical sensors and instruments for navigation measurements which have performance reliability and accuracy for long-duration manned missions in the earth-moon system and to other solar system planets.

'Chute Malfunction Blamed In Soviet Cosmonaut Death

Soviet cosmonaut Col. Vladimir Komarov last Monday was killed when recovery parachute shroud lines fouled at an altitude of four miles according to TASS. Komarov apparently chose not to eject from the 65,000-pound *Soyuz 1* spacecraft, believed to be the first element of a multi-launch mission.

A telegram of sympathy, signed by the 47 spaceflight crewmen at MSC, was sent to the Academy of Sciences of the USSR:

"We are very saddened by the loss of Colonel Komarov. We feel comradeship for this test pilot because we have met several of his fellow cosmonauts and we know that we are all involved in a pioneering flight effort which is not without hazards. We particularly want to express our deep sense of sympathy to Mrs. Komarova, to their children and to his fellow cosmonauts."

Inside . . .

A 30-foot moon pebble has been closely scrutinized through Lunar Orbiter photos for its significance to Apollo manned landings. On page 3.

At Fort Hood, MSC engineers are ironing out details of a land landing system for future generations of manned spacecraft, and some of the parachute canopies used are positively weird. On pages 4 and 5.

Scratch One Serpent



INTRUDER—Five-foot-two Eileen Knox holds up a five-foot-nine snake killed near the Bldg 416 Transportation Office last week. First thought to be a water moccasin, the snake was clobbered and then questions as to its species were asked. It is likely a chicken snake. Any guesses from snake fans?

Safety Office Holds Seminars

Two one-day safety seminars were held at MSC yesterday and today by the MSC Safety Office for MSC and contractor safety representatives. The seminars were conducted by Thomas Fitzpatrick, regional consultant with the US Department of Labor's Bureau of Labor Standards in Dallas.



Both seminar sessions were aimed toward helping safety representatives carry out safety functions more effectively in their areas of work.

Topics covered included supervisory safety responsibility, accident causes, costs and prevention, accident investigation, fire prevention and protection, determining injury rates, and safety inspection procedures. The "whats and whys" of President Johnson's Mission Safety 70 Program were stressed in each seminar, held in the Bldg 30 auditorium.

Water Tank Simulates Zero-G for Training

Eighty-two thousand gallons of water, a large tank, mockups of spacecraft hardware, and you have the beginning of a training facility to simulate the weightlessness in zero-g space flight.

Located in the high bay area of Building 5 at MSC, the Neutral Buoyancy Facility and related equipment is now in the checkout phase, and hardware evaluation by flight crews for Apollo-related weightless tasks is underway.

The tank is 30 feet in diameter and 16 feet deep, and a diatomaceous earth water filtration system keeps the water free of impurities. Access to the tank is from a walkway circling the top of the tank.

A breathing-air supply and air for operation of power tools is located around the top of the tank just above the water line. A series of quick disconnects

are provided for hose connections. At the present time SCUBA (self contained underwater breathing apparatus) gear is being used in the training. Flight pressure suits will also be used in the zero-g exercises.

Eight viewing ports are located at eye level near the bottom of the tank. Higher up on the tank, eight more ports, equipped with 1000-watt lights, provide illumination inside the tank.

In conjunction with the training facility, a hyperbaric chamber for emergency recompression is located adjacent to the walkway around the top of the tank.

Neutral buoyancy simulators programmed for use in the Water Immersion Facility include: the Command Module, Lunar Module, SIVB, SIVB Airlock, and the Apollo Telescope Mount.

Do Life Forms Exist on Jupiter? Ames Scientists Suggest They Do

Many of the building blocks of life, and possibly life itself, may exist on the Planet Jupiter, two NASA scientists suggest.

In a paper given April 12 at the American Chemical Society meeting at Miami, Dr. Cyril Ponnampuram, Chief of the Chemical Evolution Branch at NASA's Ames Research Center, near San Francisco, and Fritz Woeller, also of Ames, described laboratory experiments with a simulated Jupiter atmosphere.

Their work suggests that energy transfer and resulting chemical processes in the turbulent atmosphere of the huge planet may produce organic chemicals such as the forerunner compounds of amino acids and of the living cell nucleus.

These processes are similar to those believed to have produced life on Earth.

Thor's Hammer

The researchers used electrical discharges, "lightning" as an energy source. They found that by stimulating the activity of the top of Jupiter's atmosphere, which is believed to contain large amounts of ammonia and methane, they could produce numerous building blocks of living cells. Only water was needed to turn these building blocks into even more complex organic molecules.

Simulation of a lower layer of the Jupiter atmosphere, believed to contain large amounts of ammonia and methane, plus liquid water, also produced complex building blocks of living cells.

This layer is believed to be about 1,800 miles below the visible top of Jupiter's 2,500-mile-deep atmosphere, and to have Earth-like temperatures (0-212°F), allowing existence of liquid water.

The extreme low temperatures of the top of Jupiter's atmosphere (minus 356°F) were duplicated and did not interfere with production of complex organic molecules. The researchers used a wide enough range of pressures to determine that organic material would be produced even at the extreme atmospheric pressures of Jupiter.

Earth was Similar

Much evidence suggests that the Earth also had an atmosphere of ammonia, methane, and water 4.5 billion years ago.

Complex organic molecules are believed to have linked themselves continuously in millions of combinations in the Earth's primordial oceans. Eventually, a long-chain molecule, able to reproduce itself, appeared, marking the origin of life.

A similar series of events is a possibility on Jupiter, the two scientists believe.

In earlier primitive Earth experiments, Dr. Ponnampuram, using an ammonia, methane, and water atmosphere, has synthesized the ATP molecule (the energy mechanism for the living cell) and many of the components of DNA (the mole-

cule in each cell which determines cell growth and kind of organism.)

The laboratory simulations of Jupiter's atmosphere drew on the work of P. E. J. Peebles, Princeton University; R. M. Gallet, National Bureau of Standards; and E. J. Opik, Armagh Observatory, Northern Ireland; and others.

Jupiter Atmospheric Model

These scientists have proposed "models" of the Jupiter atmosphere based on gravitation studies and behavior of the planet's moons. They have also used spectroscopic analyses of sunlight reflected from the planet, showing what chemical compounds are present.

This work indicates that Jupiter's atmosphere, starting at the top, consists of: a layer of frozen ammonia crystals; a cloud layer of ammonia droplets; a layer of water vapor; the surface is believed to be hydrogen gas compressed into a solid by Jupiter's enormous gravity.

All layers are believed to contain substantial amounts of methane, hydrogen, helium, ammonia and neon.

The experimenters used electric arcs fired inside a pressure chamber containing the "Jupiter atmosphere". Afterwards chemical analyses identified compounds in quantities as small as a few millionths of a gram.

Giant Dynamo

Electric arcs were chosen because lightning is common on planets, and much of Jupiter's behavior is electrical. The planet is much like a huge dynamo, with a powerful magnetic field.

Despite its huge size, Jupiter rotates every ten hours. This rapid alternation of "night and day"—and hence warm and cold—is believed to produce added atmospheric turbulence and electric discharge.

In past experiments, the Ames scientists have used heat and ultraviolet as energy sources with results similar to those with electric discharges.

In the Jupiter experiments, methane and ammonia with an intense arc produced quantities of hydrogen cyanide, source of a broad range of chemicals needed to make living systems.

With a weaker arc, hydrogen cyanide again was found, plus amino nitriles. These are forerunners of many organic chemicals, and with water immediately produce amino acids, the building blocks of protein.

Electric discharges with ammonia and methane, plus water, produced the molecules previously found for the primitive Earth.

AFGE Lodge to Vote On Officers, By-Laws

Members of Lodge 1633 American Federation of Government Employees will meet May 8 at 5 pm at Webster State bank to elect officers and to vote on by-laws changes.

The May 6 AFGE banquet will feature such speakers as State Senator Barbara Jordon, Texas AFL-CIO president Hank Brown, US Congressman Bob Eckhardt and AFGE national vice president Omer Jordan, Alma Huribert at 3281 has additional information on the banquet.

Superior Performers



John Day
Supply Branch



Lucille Moser
Supply Branch

Aeromedical Association Elects Berry 1st Veep

Dr. Charles A. Berry, Director of Medical Research and

Operations, is the new first vice president of the Aerospace Medical Association.

Dr. Berry was elected to the one-year post at the association's annual conference in Washington, D.C. April 10-14.

The ASMA also awarded Dr. Berry the Hubertus Strughold Award for dedication to the advancement of the science and art of space medicine and distinguished contributions to manned space flight. The award is named in honor of Dr. Hubertus Strughold who has been acclaimed the "father of aerospace medicine" at the Randolph AFB School of Aerospace Medicine.

Dr. A. D. Catterson, assistant to the Director of Medical Research and Operations, is the new secretary-treasurer of the ASMA. He was elected to the two-year post on April 11.

MSC BOWLING

MIMOSA MEN'S LEAGUE
Standings as of April 27

TEAM	WON	LOST
Chizzlers	74½	53½
Fabricators	74½	53½
Real Timers	73	55
Whirlwinds	72	56
Technics	71½	56½
Alley Oops	69½	58½
Foul Five	67½	60½
Road Runners	67	61
Weightless Wonders	60½	67½
Strikers	60	68
Agitators	43½	84½
Hustlers	34½	93½

High Game: Bill Whipkey and Jim Grimwood 275, Bob Lacy 269.

High Team Game: Fabricators 1096, Chizzlers 1086.

High Series: Bill Holton 728, Bob Lacy 700.

High Team Series: Chizzlers 3132, Real Timers 3105.

For Advancement of Space Flight



AIAA HALEY AWARD—Mrs. Edward H. White II holds the American Institute of Astronautics and Aeronautics Haley Astronautics Award made in recognition for her late husband's "outstanding contributions during the four-day mission of Gemini IV, undergoing great personal risk in the advancement of manned space flight." In the picture, left to right, are White's parents, retired USAF General and Mrs. Edward White, Mrs. White, AIAA president Harold Luskin, and past Haley Award recipient Walter C. Williams, Jr., former MSC deputy director.

Three from MSC Participate in LSU Symposium

Three members of MSC management will take part in the May 1-2 Symposium on Management and Technology of Space Exploration at Louisiana State University in Baton Rouge, La.

In the first morning session, Space Exploration and Astronomy, MSC Director of Engineering and Development Maxime A. Faget will cover "Manned Exploration of Space."

Director of Administration Wesley L. Hjernevik will be in the afternoon Systems Management session, and will cover "Management of Large Space Systems."

The third symposium session, on the morning of May 2, will be chaired by Special Assistant to the Director Paul E. Purser. Session topic will be Space Exploration and Engineering.

Faget and Purser are alumni of Louisiana State University.

**Buy U.S.
Savings Bonds**

NO MOSS GATHERED—

ROLLING STONE MAKES TRACK IN LUNAR CRATER



MOON PEBBLE—The bright object near the center of the photo at left is a 30-foot diameter boulder in the crater Sabine D. The boulder's track down the slope of the crater is barely discernible running from the boulder to lower right of the photo.

A certain "rolling stone" on the surface of the moon was the object of a recent detailed scientific study at MSC.

This particular "rolling stone" drew the attention of MSC scientists because of its clearly defined trail and the fact that it rolled down the sloping wall of a lunar crater. Approximately 30 feet in diameter, the stone rests near the bottom of a mile-wide crater, Sabine D (23° 39' E, 1° 20' N), in the southern Sea of Tranquility approximately three miles away from one of the eight Apollo landing sites recently selected by NASA.

John Eggleston, Acting Chief of the Lunar and Earth Sciences Division, Space Sciences and Application Directorate, said the Sabine boulder is unique in that it appears to have been dislodged from the upper ridge and rolled down the wall of the

crater. Other boulders or rocks on the lunar surface appear to have been thrown out of craters, rolling a short distance before stopping.

Scientists of the Lunar and Earth Sciences Division first noticed the large stone when scanning Orbiter II photos for possible Apollo landing sites. A preliminary investigation was started several months ago to determine some of the physical characteristics of the rolling stone and of the surrounding lunar terrain.

Writing in a NASA Technical Memorandum (TM X-58007), Eggleston and his co-authors state, "The area where the boulder is located is one of the better lunar module landing sites. Thus, any information derived from this investigation will be helpful in the selection of lunar module landing sites."

A clearly defined track which runs from the ridge to the bottom of the crater, Sabine D, is what first caught the eye of MSC scientists. The track of the boulder was found to average five meters (16 feet) in width and about 700 meters (2,240 feet) in length.

Stereoscopic measurements of the crater further determined it to be 2700 meters (approximately 1½ miles) in diameter and 550 meters (1,760 feet) deep. The average slope of the wall is approximately 31 degrees and the point where the stone rests the slope is about 13 degrees.

Examination revealed the boulder to be approximately nine

meters (28.8 feet) in diameter and nearly spherical in shape. Eggleston points out in the technical report that the boulder's spherical shape is not typical of other rocks nearby or those on the rim of the crater.

Eggleston said the investigation shows the boulder does not reflect light in the same manner as most other lunar material. The report explains this unusual characteristic is due possibly to the compressing or rubbing effect of the boulder's movements down the wall of the crater.

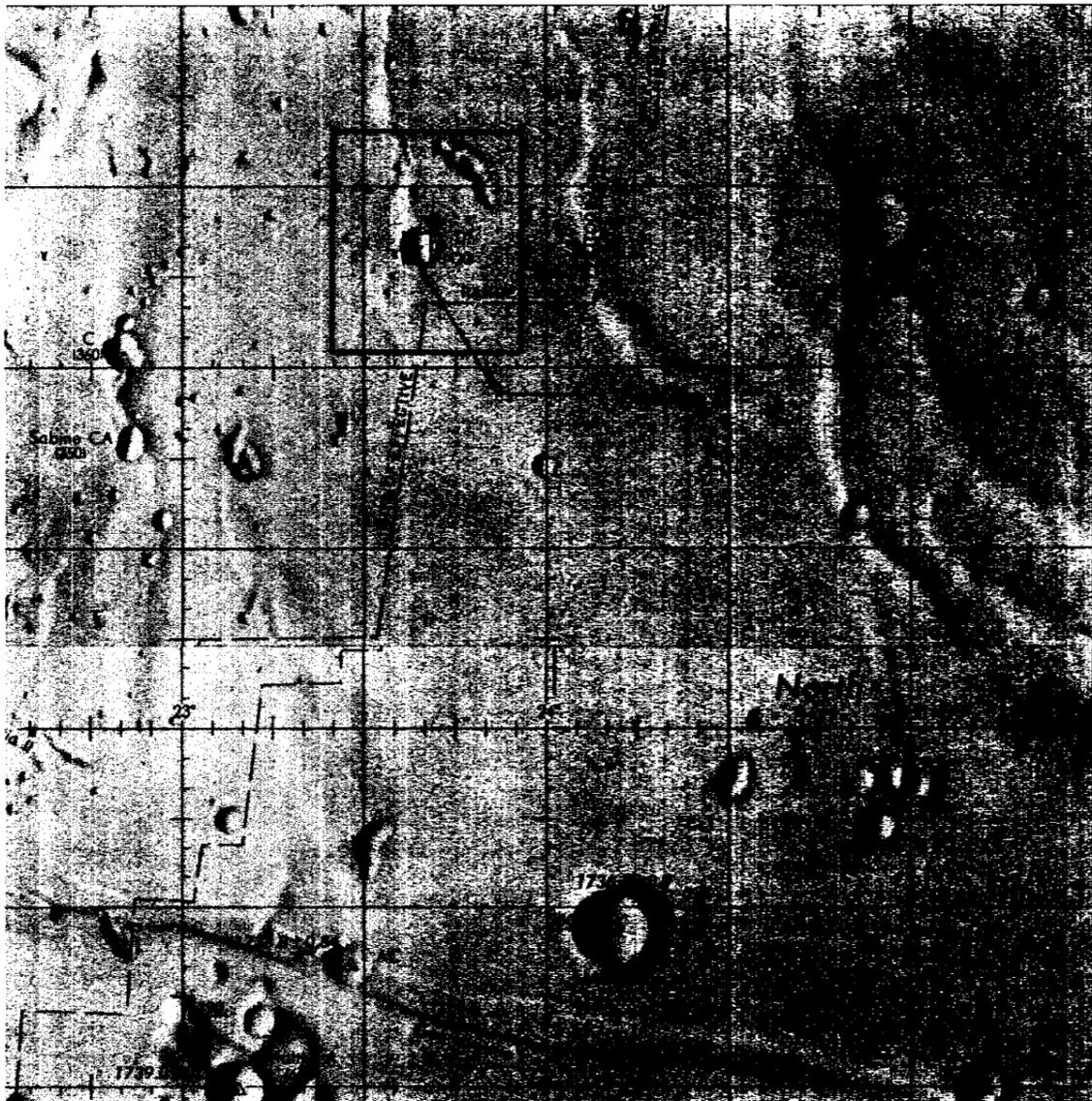
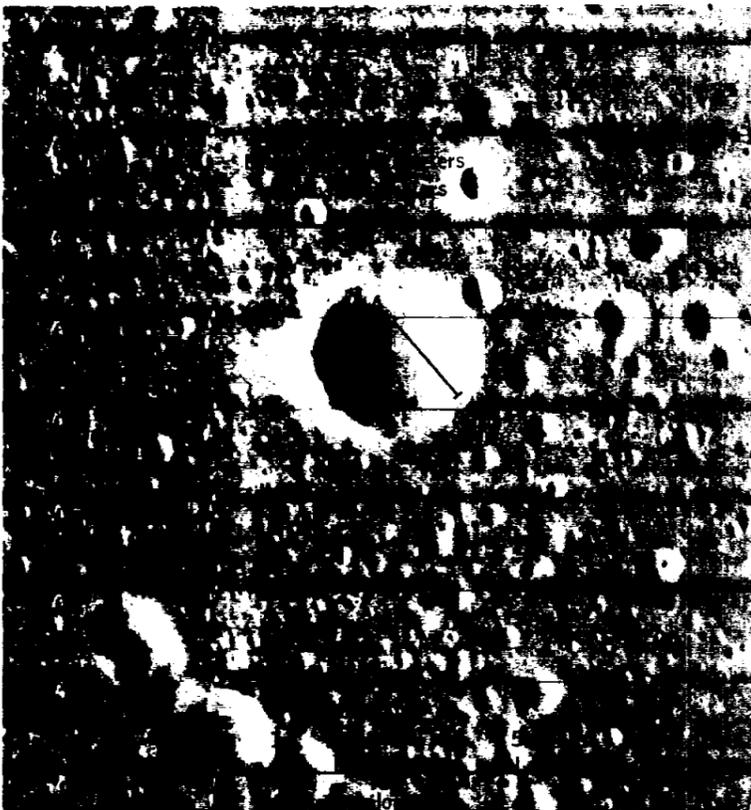
The most interesting conclusions in the report are that near-

spherical boulders with unusual characteristics exist on the moon. Some of these boulders have moved recently enough that their tracks have not been obliterated by lunar erosional processes.

Another point highlighted in the report is that the walls of the Sabine D crater appear to be covered with a compressible material which clearly recorded the passage of this boulder.

Commenting on the study, Eggleston said, "Since the track is still visible, we conclude that the moon is still a living body and still has things happening to it."

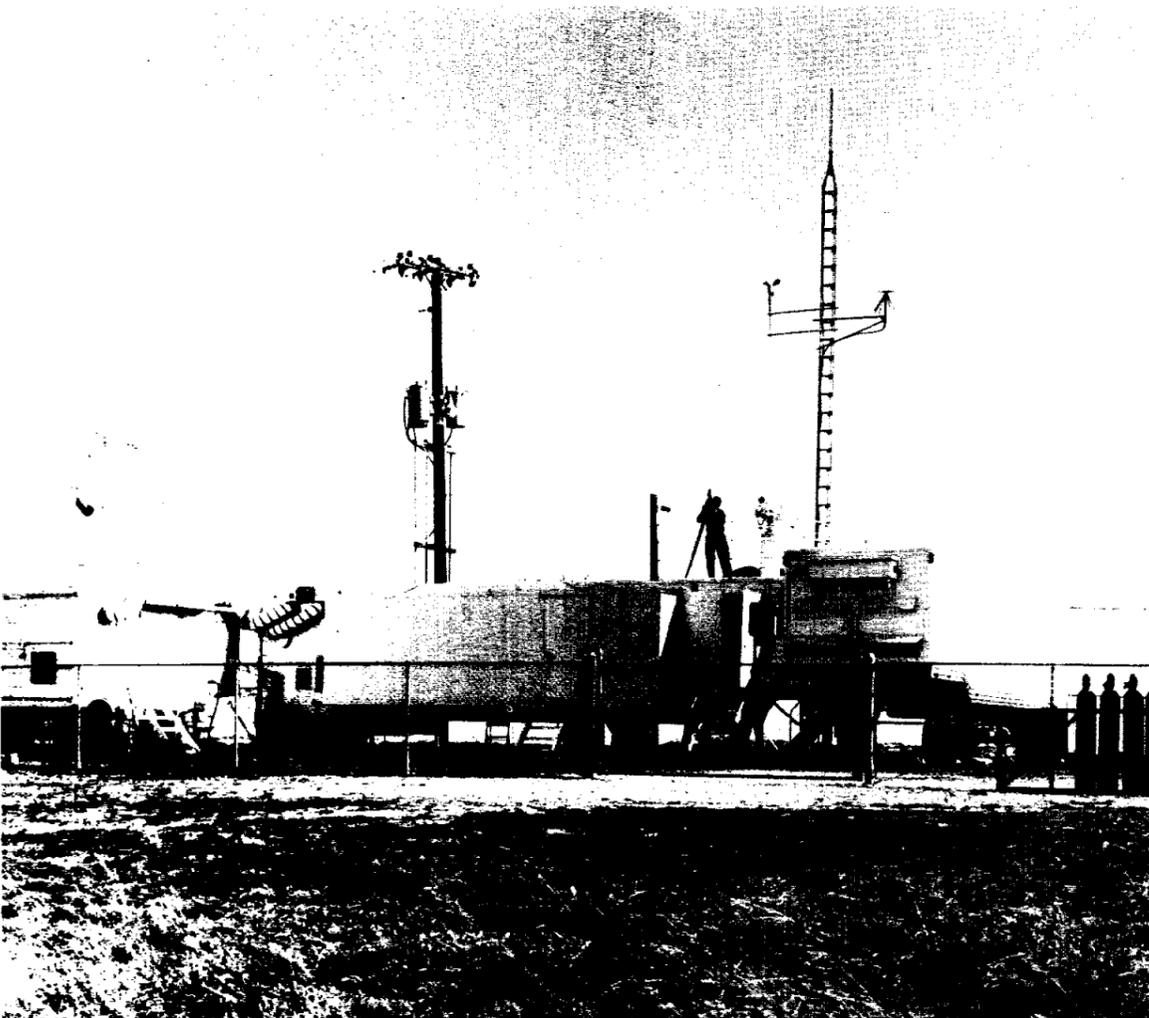
LAY OF LAND—Crater Sabine D is shown in a segment of a lunar topographic map at right. The large rectangle shows the area covered by the Lunar Orbiter II photo below, while the small square represents the area shown in the photo at the top of the page. Below, line A-B represents the distance traveled by the 30-foot boulder.





RIGHT TURN—Head on, the parawing looks like Batman's cape, but likely has a greater gliding capability. Built by Irving Air Chute Company, the parawing has a glide ratio of about 2.5:1. That is, for every mile of altitude it will glide two and a half miles forward.

HILLTOP OUTPOST—Three vans in a fenced compound on a Fort Hood hilltop make up MSC's Advanced Landing System development facility. The left van is radar; the middle van is the Terminal Landing Station and the right van is the Landing Operations Test Vehicle control van, or pilot's cabin. Weather balloons released from the site prior to an LOTV drop provide data on wind drift at various altitudes.



They devel returnin dry-lan

landing, the helicopter settled to the ground nearby to await attachment of the vehicle and its bat-shaped canopy for the next drop.

So went a typical run of the Terminal Landing Station being developed by MSC's Landing and Recovery Division for future generations of spacecraft. The development, underway at the Army's Fort Hood armored training center in Central Texas and at Ellington AFB, is part of MSC's effort toward perfecting a land-landing technique for orbital spacecraft.

Many Types

Various types of canopies—parawing, parasail, cloverleaf, sailwing—under evaluation by Landing and Docking Mechanics Branch of Structures and Mechanics Division are given workouts during developmental tests of the Advanced Landing System.

The Operational Evaluation and Test Branch of Landing and Recovery Division is responsible for developing the Terminal Landing Station.

The Terminal Landing Station facility at Fort Hood consists of a ground station with a radar van, a Terminal Landing Station (TLS) and a Landing Operations Test Vehicle (LOTV) van—the "pilot's" cockpit.

Radar Tracked

Radar data on the location of the LOTV during its climb to altitude aboard the helicopter and after it is dropped is fed into the TLS van where computer-driven digital and scribing-blitter displays provide vector data to the TLS controller. He also has a display of wind velocity and direction.

The olive-drab "Huey" turbine-powered helicopter lurched upward slightly as the red and white payload dropped from the side rack toward the rolling landscape 10,000 feet below. A green triangular canopy looking like something out of Batman inflated above the 400-lb payload and the rate of sink slowed to 15 feet a second.

Spiraling around the descending dummy spacecraft, the helicopter pilot followed the turns of the vehicle suspended on risers beneath the green canopy.

As if it knew where it wanted to go, the vehicle steered toward a gravel landing strip on the top of a hill. In a semi-dark van on the top of another hill several miles away a "pilot" wobbled a control stick salvaged from a fighter plane as he watched a television monitor on his console.

The terrain below the vehicle rotated on the screen as he commanded banking turns with the hand controller. Radio signals actuated motors aboard the vehicle which reeled in or let out control risers to turn the vehicle. His TV picture came from a wide-angle TV camera peering out the belly of the test vehicle.

Headings, altitude, distance to target and other information came over the pilot's headset as a man in an adjacent van vectored the pilot toward the landing strip. The last several hundred feet to the landing were flown by TV reference, and after vehicle

op techniques g space crews d touchdowns

Radar-generated displays include gliding range to target, heading, time-to-landing, altitude, and rate of sink. The TLS controller can call out of the

computer terrain slides upon which the scribing plotters indicate gliding range from present altitude as well as the LOTV's position in real-time as it descends on whatever type canopy is being evaluated. The LOTV is fitted with a radar transponder.

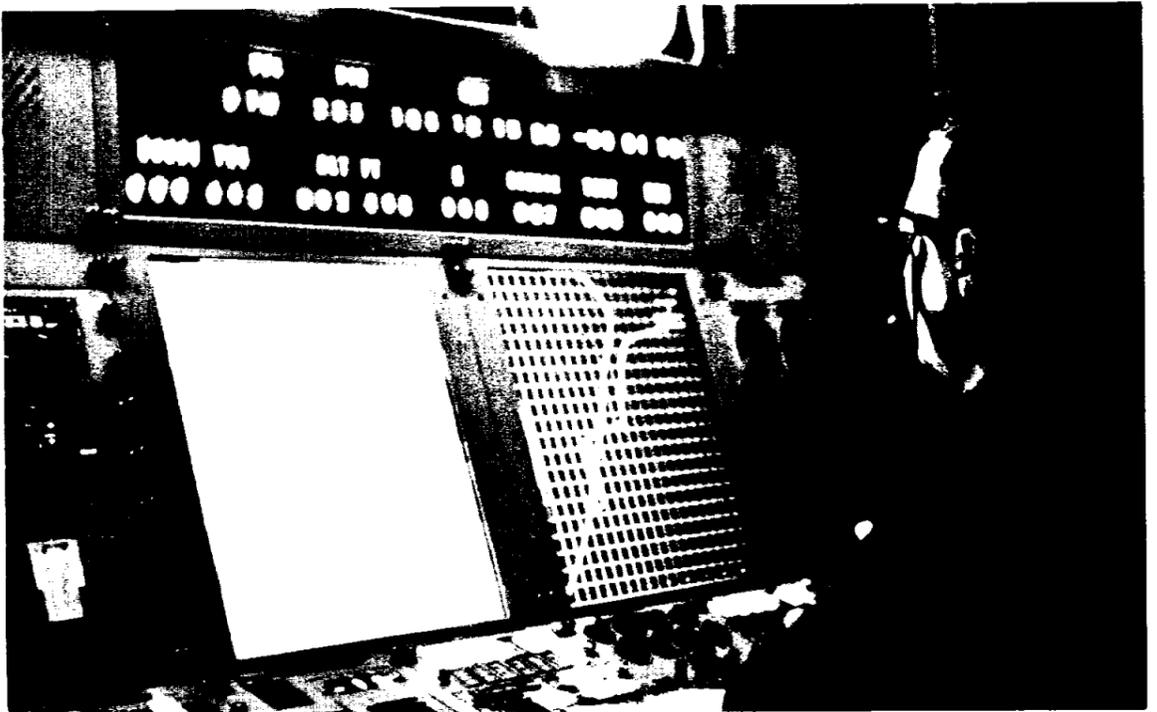
In much the same way an air traffic controller vectors air traffic toward destinations, the TLS controller directs the LOTV's pilot in the next van toward the landing site. Wind drift is compensated for in selecting the drop point in much the same way deorbit position would be selected in a full-scale orbital entry.

The gliding qualities of the canopy, or L/D (lift-to-drag ratio) are utilized to steer out cross-range and downrange distances needed to reach the target. As instructions from the TLS controller come into the pilot's headset, he responds by moving the control handle for a right or left turn to get into the right position for final approach.

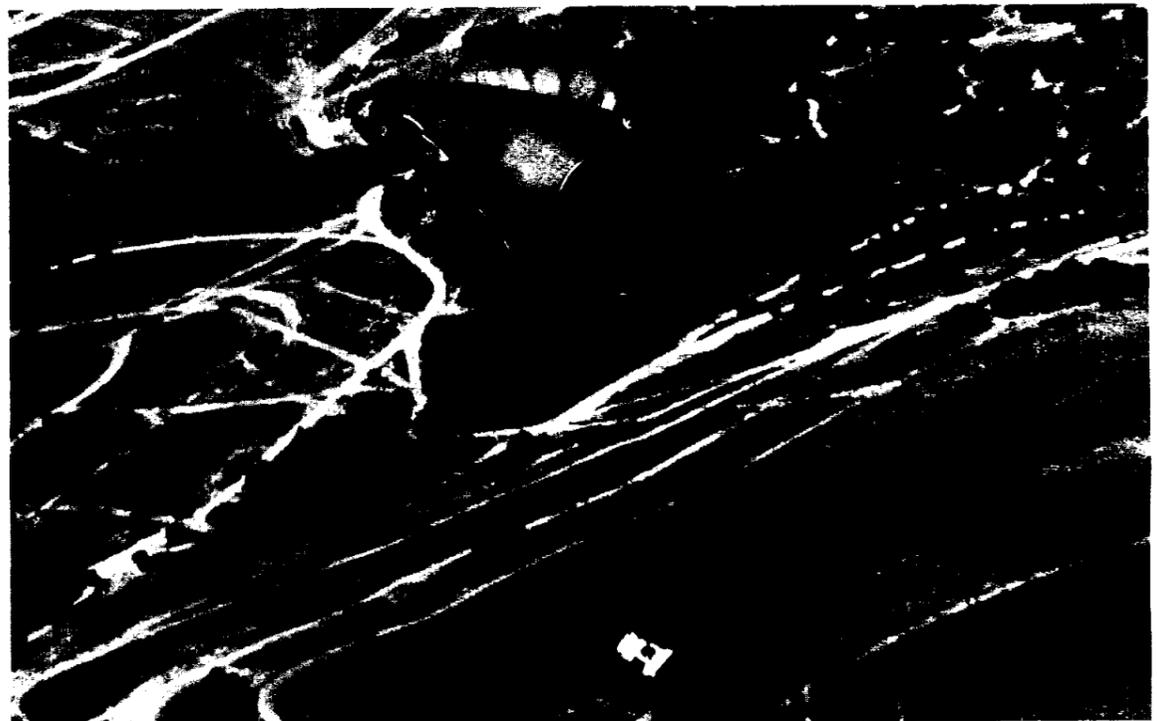
Forerunner

The Terminal Landing Station used at Fort Hood is a prototype of the ground station that would be needed post-entry to aid a manned spacecraft to land on a pre-selected open land area, such as a dry lake on an airport. Several hundred drops, using various canopy configurations, have been made at Fort Hood during the past year.

And while the capability for water landing will always be needed because of the possibility of launch aborts, the capability for land landing is a desirable goal for reducing expensive logistics involved in support of a global sea recovery force.



GROUND WATCH—Terminal Landing Station controller Don Borque observes scribing plotter console displays of the Landing Operations Test Vehicle position over the Fort Hood Terrain and relative to the desired glide slope to reach the target landing strip. Computer-generated digital information at the top of his console lists vehicle headings, rate of sink, altitude, forward speed and time to landing. The LOTV's radar transponder aids the ground radar in tracking the vehicle during flight.



FINAL APPROACH—A 20-foot long parawing canopy gently lowers the 400-lb LOTV toward the landing point at about 15 feet per second. The parawing is one of several canopy configurations evaluated in conjunction with the Advanced Landing System. A parawing for a full-scale Apollo-type spacecraft would be 130 feet across.

PILOT'S COCKPIT—Fred Koons watches the ground get nearer through a TV monitor in the LOTV van. With the control handle, he sends commands to canopy riser take-up reel motors in the LOTV to effect turns. Meters on the left end of the console tell Koons the position of control risers for keeping the canopy in trim and at its optimum glide performance. A wide-angle TV camera on the LOTV transmits a down-looking picture from the vehicle to the van.



TOUCHDOWN — Steered by radio commands from the LOTV van through TV visual cues and by instructions to the pilot from the Terminal Landing Station controller, the parawing/LOTV nears impact in the landing area.



UNITED STATES SAVINGS BONDS/FREEDOM SHARES

April 17, 1967

MEMORANDUM TO ALL NASA EMPLOYEES

The 1967 NASA Savings Bond Campaign will be conducted in all installations May 1 through June 16. In a recent message to the Interdepartmental Savings Bond Committee, the President stated:

"We are calling upon every American to invest all that he can in United States Savings Bonds--and our new "Shares in Freedom." We in government should be the first to heed this call. We who have the daily opportunity to work for our country should best understand the importance of these bonds. Each share that we buy strengthens America and furthers the cause of freedom throughout the world."

It will again be my privilege to serve as Chairman in the NASA Savings Bond Program; Mr. Alfred S. Hodgson, Director, Headquarters Administration Office, will assist me as Vice Chairman and Miss Eleanor G. Borella as Campaign Manager.

About new Freedom Shares

This year you will have an opportunity to purchase a new U.S. Treasury Savings Note called "Freedom Shares." Freedom Shares --

- Pay 4.74% interest when held to maturity--4 1/2 years after issue.
- Can be purchased only in combination with Series E Bonds through the Payroll Savings Plan.
- Are available in four denominations: \$25; \$50; \$75; and \$100.

You may have hopes to buy a home some day--or to give your children a college education or dream of a leisurely retirement--all of which require money.

When your Canvasser contacts you during the Campaign to join the Payroll Savings Plan--**YOU** will have an important decision to make--to buy a Bond--a combination Bond/Share--or, if already a member of the Plan, to increase your present deduction.

This decision is, of course, an individual, personal one. Every family has its own hopes and dreams--countless families have found the Payroll Savings Plan the answer to their needs. The benefits which will accrue to you under this Program and to the economic well-being of our country play an important role in assisting and maintaining a stable financial future for the Nation.

I urge, therefore, that you give this campaign your full support.

James E. Webb
Administrator



Civil Service Proposes Benefits Law Changes

Federal employees would have survivor, disability, and retirement protection at least at the level provided by social security under proposed legislation submitted to Congress by the Civil Service Commission.

Federal employees and their families are not eligible for benefits under the civil service retirement system until the employee has completed five years of civilian service. Even after an employee has completed five years of service, the benefits for the survivors in the event of his death are likely to be much less than the survivor benefits that would have been payable if his work had been under social security. Large numbers of workers shift between Federal employment and private employment. When such an employee leaves Federal employment, he loses disability and survivor protection under the civil service retirement system and may not work long enough under social security to qualify for its benefits.

The proposed legislation to fill these gaps in protection for Federal employees follows the 1966 recommendations of the President's Cabinet Committee on Federal Staff Retirement Systems. It involves a double-barreled approach. Employees

who die or become disabled before they complete five years of service, or who leave the Federal service and do not have the protection of the civil service retirement system when they die, become disabled, or reach retirement age, will have credit for their Federal service transferred to social security.

The social security benefits provided by this transfer of credit will be financed in part by withholding from the civil service retirement deductions of such an employee a social security "tax equivalent." In case of death of the employee, the amount of social security taxes that would have been paid by the employee if his employment had been outside the Government will be withheld from the lump-sum benefit payable to the survivor from civil service retirement.

The second part of the double-barreled approach provides that, if an employee or his survivors are eligible for benefits under civil service retirement, the amount of the benefit when added to any that might be payable by social security, will be at least at the level that would be payable if the Federal service had been covered under social security.

Teen Hootnanny May 6 Features Folksong Groups

Folk music and musical folk will be featured at the May 6 EAA-sponsored teen hootnanny at the Kemah Elks Club. The hootnanny will run from 8 to 11 pm.

Among entertaining groups will be Max Krchnak of Computation and Analysis and Ron DuVal of Flight Crew Support Division, each with his own three-man guitar and singing group. Folksinger Carol Neckar of Victoria, Texas will also appear.

Song sheets will be distributed for a sing-along session, and the \$.50 admission price includes refreshments. The hootnanny is a bring-your-own-cushion affair.

Hootnanny tickets are available from the following EAA representatives: Bob Merrifield, Room 354 Bldg 4, Ext 3621; Kitty Cornish, Room 2036 Bldg 30, Ext 3128; Peggy Chambers, Room 248 Bldg 16, Ext 2403; Tim White, Room 248 Bldg 31, Ext 2005; Sue Richardson, Room 533 Bldg 45, Ext 4616; Ted Lapko, Room 326 Bldg 2, Ext 3901, and Jerry Hapton-stall, EAFB Bldg 317, Ext 7361.

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

Space News Of Five Years Ago

April 29, 1962--USSR was considerably behind the US in facilities and equipment for biological and medical research. Dr. A. N. Studitsky complained in an article in *Vestnik Akademii Nauk*, organ of the Soviet Academy of Science.

During April: Dr. John C. Houbolt, of NASA's Langley Research Center, writing in the April issue of *Astronautics*, outlined the possible advantages of lunar-orbit rendezvous for a manned lunar landing as opposed to direct flight from earth or earth-orbit rendezvous. Under this concept, an Apollo-type vehicle would fly direct to the moon, go into orbit around the moon, detach a small landing craft which would land on the moon and then return to the mother craft, which would then return to earth. Advantages would be the much smaller craft having to perform the difficult lunar landing and take-off, the possibility of optimizing the smaller craft for this one function, the safe return of the mother craft in event of a landing accident, and even the possibility of using two of the small craft to provide a rescue capability.

Development of an advanced state-of-the-art pressure suit and helmet was started. This action was taken in preparation for the Mercury extended range or one-day mission program. The objectives were aimed at improvements in unpressurized suit comfort, suit ventilation, pressure suit mobility, electrically heated helmet visor with additional light attenuation features, and the fabrication of a mechanical visor seal mechanism.

May 4, 1962--Optical and radar observations of Project Highwater experiment, 23,000 gallons of water bursted from upper stages of Saturn test launch at 65 mile altitude on April 25, showed that the burst took 2-3 seconds to expand to about 10 times the size of the moon in a roughly circular pattern, and lasted about 10 seconds. A second fainter trail, about one lunar diameter, followed along the trajectory from the burst and lasted a few minutes, presumably caused by venting out of the incompletely

destroyed second stage. Project Highwater was an MSFC responsibility, a bonus experiment to the Saturn test conceived by Dr. Charles Lundquist.

A memorandum was issued on proposed experiments for inclusion in Mercury manned orbital flights. This action was in keeping with a statement made by Walter C. Williams before a University of Houston audience that the spacecraft would be used as a test bed for more ambitious space projects.

May 7, 1962--NASA announced at Cape Canaveral that MA-7 launch, scheduled for May 15 or later, would be delayed several days because of checkout problems with the Atlas booster.

May 8-10, 1962--Second National Conference on the Peaceful Uses of Space sponsored by NASA was held at Century 21 Exposition in Seattle, Wash. In a message to the Conference, President Kennedy noted that the US was already "working hand in hand with scientific groups of 50 nations. Ours is an open society and the benefits of our space program will continue to flow throughout the world. It is my hope that the Soviet Union will cooperate constructively in the proposal which we have made so that all peoples will gain in the improvement of weather observation, communications systems and the manifold output of the peaceful application of space technology."

May 11, 1962 -- Problems with spacecraft control system could delay the MA-7 launch attempt until at least May 19, it was reported from Cape Canaveral.

RASPO-Downey Raises Crew Memorial Fund

MSC employees assigned to the RASPO-Downey office have contributed a total of \$150 to scholarship and memorial funds at Purdue University and the US Military Academy for Apollo 204 crewmen Virgil I. Grissom, Edward H. White II and Roger B. Chaffee.

Ode to the Groundskeepers

*Thank you for watering my car every day.
I doubt it'll grow, but then it may.
The paint is all dulled from your insect spray,
And grass and rocks your grasscutters flay
Into my hubcaps, day to day.*

*My car isn't much, in size it is wee.
But I can't buy another on pay of GS-3.
So keep up the good work; my car'll soon be
A beat-up abomination for all to see.
But dammit!, don't you realize it's important to me?
--Anon.*

ROUNDUP

EMPLOYEE NEWS

READ FINE PRINT—

Incomplete Ads Often Land In Swap Shop Wastebasket

Since the inception of *Roundup* Swap Shop classified ads a year ago, the Swap Shop has grown from a meager four column inches that first issue to more than 30 column inches in the April 14, 1967 issue.

Apparently, Swap Shop ads do some good, for a lot of the same people keep sending in ads to sell different items from time to time — and that is what the Swap Shop is for.

Since the *Roundup* is printed with appropriated money, regulations prohibit inclusion of commercial advertising.

The editor feels, however, that attempts are made occasionally to film-flam him with an ad submitted under the guise of an MSC employee personal ad that is really a commercial ad for a brother-in-law in the real estate or used car business. The editor reserves the prerogative to chuck such suspect ads in the round file.

Moreover, many advertisers persist in using office extensions instead of home telephone numbers, as requested in the fine print in the Swap Shop standing head in each issue. The purpose is to reduce the amount of personal business conducted during office hours and on government telephones.

When an advertiser does not have a home telephone number, an exception is made to this rule and the office extension listed. Also, MSC management feels that it is in the best interest of the Center to promote car pools. Ads requesting car pools or riders may use office extensions.

Many ads come in unsigned, with just a telephone number. Again, the fine print says include name and home telephone number. The editor, working single-handedly to produce the *Roundup*, certainly has not the time to follow up on each ad to find out the name of its submitter or the home telephone number. Such anonymous ads are also destined for File 13.

Exceptions to the home telephone rule are off-site contractor employees whose management has no objections to personal business on company time and telephones.

Roundup Swap Shop ads are a convenience and not an obligation; regulations permit non-commercial employee personal ads in center house organs but do not require them. Submission of ads including all the information requested will insure continuation of *Roundup* Swap Shop service.

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

1 and 1/2-acre sandy, high-ground country lots within sight of MSC, good drainage, reasonable. Mac Owen, 877-1689.

3-bdr 1 1/2-bath brick, 2-car garage, central air/heat, large paneled den, living room, kitchen with dining area, large walk-in closets, 80x120-ft lot, backyard fenced, schoolbus available. Take \$1500 for \$3000 equity; \$110/mo payments include everything. James Weaver, 1506 Webster St., League City, 932-2371.

3-bdr 2 1/2 baths in Clear Creek Woods subdiv of Friendswood, living room, dining room, paneled den w/fireplace, all-electric kitchen w/breakfast area, all-brick exterior, 1980 sq ft living space, heavily-wooded area. \$20,800; \$1800 down. Charles Shoemaker, 1206 Timber Lane, HU 2-7874 or 591-3300 Ext 3182.

3-2-2 brick in Sagemont, central air/heat, built-ins, fenced, family room, kitchen w/dining area, separate living and dining rooms. \$1600 equity—no reasonable offer refused. Available June 1. Larry Frazier, HU 7-0648.

.449-acre wooded lot bordering golf course fairways in Country Club Estates, Dickinson, city utilities, near school. Joan Hulo, WI 5-4685.

3-1-1 in Crestmont Park, cyclone fence, 220v wiring, immediate move-in. Owner equity \$600, no closing cost. A. David Perez, 5131 Denoron, RE 3-1313.

4-bdr 2-bath in Clear Lake City, living room, dining room, eating area in kitchen, air conditioned, 2-car garage, screened porch, landscaped, drapes, corner lot. 6% mortgage, no closing costs; \$2,400 equity, \$159/mo total. Pete Clements, 1927 Huntress Lane, HU 8-4037.

For rent: unfurnished cottage in Bacliff, 2-bdr, wall-to-wall carpet, fenced yard, want couple or single person. Doris Hetkes, 966-2335 after 4.

4-2-2 golfcourse lot in Clear Lake City, separate family and living rooms, landscaped, carpets, drapes. Equity plus take over 6% loan payments or refinance FHA. Dave Brown, HU 8-4022.

4-bdr 2-bath in Seabrook Baywood subdiv, living room, dining room, family room, carpets, drapes, central air, dishwasher, disposal, 2-car detached garage, swimming pool, waterfront privilege, fishing pier, boat ramp, on 100x145 lot. C. J. Hall, GR 1-4586 after 5.

120x150 lot in El Lago Estates, trees, fenced three sides. J. C. French, GR 4-2457.

4-bdr 2 1/2-bath contemporary ranch style, 17x27 family room with fireplace and cathedral ceiling, 2 1/2-car garage, central air, 2000 sq ft, 1/2 block from boat ramp in Timber Cove. Assume 5 1/2% loan, \$3000 down, \$165/mo. John C. Marshall, 877-3100 Kemah.

FOR SALE—AUTOS

1962 Rambler Classic station wagon 4-door delux 400 series, factory air, reclining bucket seats, headrests, vinyl interior, radio, autotrans. Original owner who ordered it from factory. \$875. Financing can be arranged; consider trade. Floyd Turner, RE 3-7667.

1961 Volkswagen, xclnt mechanical condition, 49,000 miles, one owner. \$600. Jim Peacock, 932-4458.

1958 Cadillac Coupe de Ville, extra clean, new double-duty battery, new tires, (no air). Best offer. Chris Critzos, Kemah 877-3218.

1962 Ford Fairlane, 49,000 miles, green and white, new tires, has sticker and plates, runs perfect. \$500. John Bergeron, 932-2148.

1962 MG Midget, 48,000 miles, Nassau Blue w/black top, has sticker and plates, good condition. \$350. John Bergeron, 932-2148.

1964 Buick LeSabre hardtop, air, power, low mileage, one owner, xclnt condition. \$1895. Luther Turner, HU 7-1464.

1964 Dodge Dart, 6-cyl stick, red, good condition. \$700. Lena Collier, GR 2-6243 after 5.

1964 Datsun, turquoise, 4-door sedan, radio, 4-speed, Mark IV air, good condition. \$850. Diane Brazil, HU 8-0210, Ext 58 days.

1957 Oldsmobile to be dismantled for parts. Ted White, GR 4-2214.

1966 Triumph TR-4A, 10 months old, xclnt condition, Blaupunkt AM-FM radio, Michelin X tires, extras. \$2500 or nearest offer. Peter Vorzimmer, HU 4-1589.

1967 MG-B GT, seven months old, 4000 miles, like new, AM-FM radio, middle blue w/black interior. Cost \$3400 new. Offers...? Owner leaving country. Peter Vorzimmer, HU 4-1589.

1966 Chevy Nova 4-door, 6-cyl autotrans, air, radio, heater, beige, clean. \$150 equity. Barbara Cain, HU 6-7710.

1962 Ford Fairlane, power, air. Col. C. S. Overstreet, 2014 Fairwood, Clear Lake City, HU 8-2705.

1964 Hillman Minx, 4-door sedan, low mileage, xclnt running condition, spare parts kit, ideal economy car. LtCol Foster, HU 7-1400 Ext 218 or HU 7-1694 after 4:30.

FOR SALE MISCELLANEOUS

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.

Wheeled cannister Ward's vacuum cleaner, all attachments. \$25. Earl Rubenstein, 877-3288.

Membership in Edgewood Swim Club, 5815 Van Fleet St., (across from K-Mart), family lifetime corporate share \$200, no-interest time payment available, shares may be resold, summer membership \$60 until June 1, No. 2 Olympic pool (82-5x42) with kiddie wading pool, lifeguard and manager, clubhouse facilities. Wil Brugger, MI 5-5287 after 6.

3-piece gold nylon frieze sectional sofa. \$60. Lena Collier, GR 2-6243 after 5.

Fender Stratocaster guitar, new paint, 3 pickups, tremolo bar; Princeton reverb amplifier, new condition, has vibrato and reverb pedal, 30-foot cord. Guitar alone \$150; amplifier alone \$100; both \$250. John Bergeron, 932-2148.

AKC toy silver poodle pups, males, shots. Also 7 1/2-inch silver male at stud. Charlotte Hilger, HU 4-4804.

1 1/2-ton 220-v Westinghouse window air-conditioner, works perfectly. \$75. W. D. Bronson, GR 7-1698.

1959 Zenith table-model black & white TV, fair condition, 22-inch screen. \$50. Mrs. E. H. White II, 877-2231.

Spaulding Pacesetter golf club; new—never played, 3, 5, 7 and 9 irons plus putter, 1 and 3 woods, dozen balls, black leatherette bag. Asking \$60. Jeff Vyner, Ext 3241 (no home phone).

Model 98 8mm Mauser rifle, \$30. Drafting planometer, \$5. Tachometer, \$15. Six original oil painting from \$5 up. Battery-powered

shoeshine kit, new \$3. Civil War bayonet \$4. Miscellaneous electronic parts \$5. Carroll Hopkins, HU 4-2838.

Montgomery Ward camping trailer, makes into 8x12 tent, like new. \$325. L. G. Kaigler, 877-4731 or UN 4-4714.

Standard Relaxacisor, used three months, xclnt condition. \$90. Tom Gallagher, HU 7-0149.

Argus C-3 camera with flashgun. \$10. G. Bauch, NA 2-4380.

Frigidaire dishwasher in xclnt condition, baby bassinet with mattress and frilly nylon skirt, room heater, electric mixer, boys clothing, baby clothing. P. Pakeltis, 932-4709.

Size 10 wedding dress, has been cleaned and is in perfect condition, train detaches from shoulders. Carol Mobley, MI 5-0339.

Fender guitar and amplifier, like new. Bill Pittman, HU 7-0004.

1964 tent trailer in xclnt condition, heavy white canvas top, blue sides, nylon floor, sleeps six comfortably, 4-inch thick foam mattress sleeps double, three big screened windows, plenty storage space, spare tire included. \$350. Ed Lattier, 534-2756.

Free: white Siamese female with five black and kittens, no limit. John Cunningham, HU 8-1390.

HT-32 xmiter, SX-101A rcvr, 500-watt amplifier, xclnt condition, all for \$350. Tom Leech, HU 4-7784.

Alcott Sunfish sailboat with 500-lb capacity small-wheel trailer, both in xclnt condition. Will trade for car. G. B. Keith, HU 8-1174.

Five new Goodyear 7.00/7.35x14 4-ply custom nylon super cushion tires. Retail for over \$30 each; all for \$75. J. R. Gurley, Dickinson 534-3800.

Pair size 10 man's golf shoes, \$5. Car-top carrier, \$7. Carl W. Busch, RE 3-8286.

Garage sale May 6 and 7, 9 to 5 at Lake House Apartments, 3325 NASA Blvd. Ladies clothes sizes 7-9, shoes 6 1/2A-7AA, lamps, furniture, bric-a-brac and junk.

Hi-Standard .22-cal revolver with holster, good condition. \$25. Bob Handley, HU 2-7041.

Quachita deluxe camper, used for three trips (8 nights), sleeps six, stove/sink combo, dinette, icebox, spare, heavy canvas and small boat rack, easy to pull and set up. Jim Prim, 877-2856.

18,000-BTU air conditioner \$75. Two bicycles, \$4 each. Small old refrigerator \$35. Sears vacuum cleaner \$7.50. Ben Locher, GR 1-4387.

International stamp collection, over 1900 stamps, most over 15 years old, good Chinese collection included. All for 5c each mounted in crystal mounts in Scott's albums I and II, or \$95. Ben Locher, GR 1-4387.

Mahogany Victorian-style bedroom suit—bed, chest, vanity with bench, springs and mattress, \$80. Platform rocker, perfect condition, turquoise, \$25. Drafting board in good condition, \$25. Barbara Niemeyer, HU 6-6870 after 6.

24-inch Schwinn boys bike, new tires and tubes, saddle baskets, good condition. \$15. J. W. Ogden, HU 4-3097.

WANTED

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

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

Lost: prescription sunglasses, brown lens, brown striped frame. R. C. Bake, Ext 5451.

Want light-color 1965 Olds 4-door sedan (no hardtop). Consider clean 1964 model also. Bob Giesecke, Alvin OL 8-5489.

Want riders to join carpool from Cullen Blvd-UofH area to Bldg 2 8:30-5. Sandy Dunlap, CA 3-9213 after 6 and weekends.

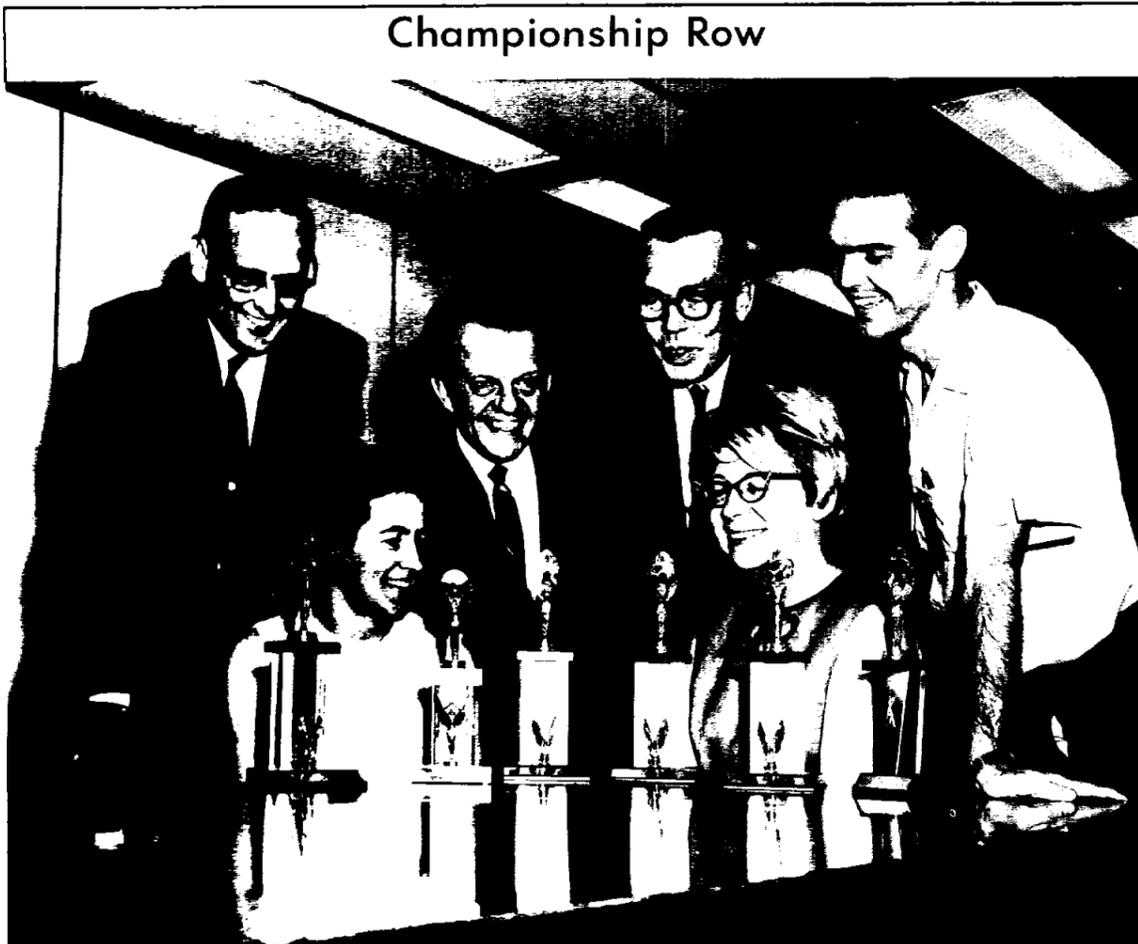
Two bachelor girls would like to share large 2-bedroom 1 1/2-bath luxury apartment in League City with another bachelor girl. Janie Lewis, 932-4315 after 4:30.

Bond Drive Starts

The government-wide Savings Bonds Campaign gets under way May 1 and runs through June 16, and offers for the first time the new Freedom Shares which yield 4.74 percent when held to maturity.

Read the letter to NASA employees from NASA Administrator James E. Webb on page 6 of this issue and learn why Freedom Shares are a good deal.

Championship Row



BRIDGE ACES—Members of the MSC Duplicate Bridge Club who carried home all the hardware in 1966-67 tournaments are shown with their trophies. Standing, left to right are Ray Dickerson, Paul Nielson, Art Manson and Joe Snyder. Seated are Norma Dreszer and Leona Kempainen. In recent Club play, Paul and Mary Swanzy won the April 11 Mixed Pair Championship. Mark Powell and Kay Dearman placed second, just one-half point under the winners. Club Master Point Game winners March 28 were: D. and S. Enerson, North-South first, and Tom Holt and Charles Filley, second. Paul Swanzy and Bill DeGeorge, East-West first, and Al Decker and Leona Kempainen, second. April 4 winners were: Paul Swanzy and Mark Powell, North-South first; Joe Snyder and Al Decker, second; Emer St. Leger and Max Cone, East-West first; John Herrmann and Ray Clemence, second.



MOBILIZING AGAINST LEUKEMIA—The MSC Blood Deposit Program will donate to the Leukemia Society every pint of blood in excess of 100 pints collected during the quarterly bloodmobile visit April 24 through May 2. Shown pledging excess blood for the fight against leukemia are Gerald Holder, Lockheed, Blood Deposit Program committeeman; Edie Martin, regional director of the Leukemia Society; Rita Sommer, committee member, and Ed Stelly, MSC Blood Deposit Program chairman. The MSC Blood Deposit Program is operated for MSC and contractor employees and their families.

Airshow Agenda Adds Mustang Fighter Act

Sixteen-point rolls in a World War II P-51 Mustang fighter will be one of the highlights of the June 10-11 Clear Lake Rendezvous Airshow. Piloting the Mustang will be North American Aviation's Bob Hoover.

Other Airshow acts include lady aerobatic pilot Mary Aikens and jumps by members of the Galveston Skydiving Club. The Airshow, sponsored jointly by the Aero Club and the Clear Lake Chamber of Commerce, will be held at Spaceland Airpark in League City.

The Aero Club has switched meeting night to the first Monday of each month. The next meeting will be May 1 at 5:15 pm in the MSC News Center, Nassau Bay Bldg 6. All Aero Club members are urged to attend.

Instrument Ground School has been cancelled for the past two weeks because instructor Sal Tripoli has been on travel, but classes resume May 3 at the News Center.

Hourly prices on the Aero Club's 7AC Champ have been reduced to \$4 to allow more pilots to be checked out. Club

Spanish Club Meets

The MSC Spanish Club will feature a Mexican travel color film at its May 2 meeting at 5:15 pm in Room 118, Bldg 13.

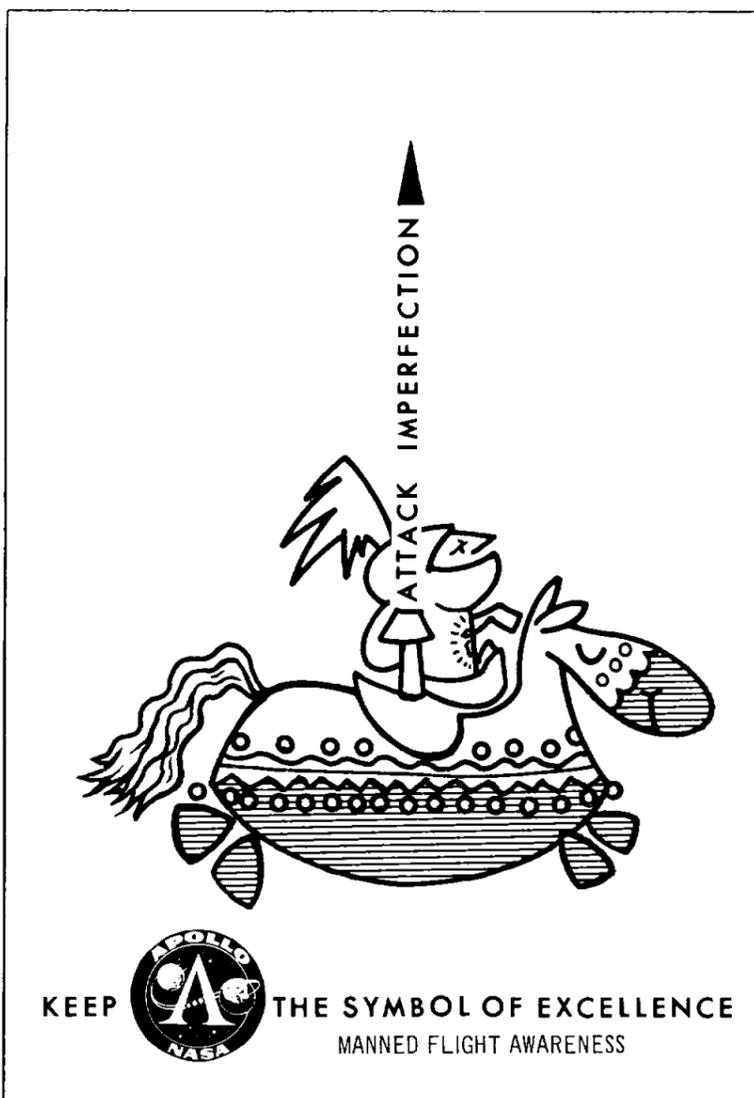
Temporary Club officers are Jack Capps, president; Les Goodheart, vice president; Helen Newton, secretary-treasurer, and John B. Williams, program chairman.

Ellos hablan español en la película. Vienes y ves esta película muy interesante.

Softball League Writes Rules

League rules will be formulated at the final softball league meeting May 4 at 5 pm in Room 651, Bldg 2. Team rosters must be turned in at this meeting and no further team entries will be accepted.

League schedules will also be distributed at the meeting.



ROUNDUP

SECOND FRONT PAGE

Model Trainmen Run Station Within Station

MSC and contractor employees interested in HO-gauge model railroading are invited to attend the weekly meetings of the Houston Society of Model Engineers. The Society meets Wednesdays at 7:30 pm in the club room on the second floor of the Houston Union Station, Texas and Crawford Streets, Houston.

Norman F. Eubanks of Administrative Services Division, Ext 4326, is Society secretary.

"By pooling resources, skills and interests, a far more rewarding enjoyment of railroading can be achieved through club membership than could be realized by

an individual," said Eubanks. "All the members want something more than a few tracks on a 4 by 8-foot sheet of plywood."

The Society of Model Engineers has occupied the present facilities since April, 1965. The club now has 300 feet of main-line trackage in addition to terminal, yard and siding trackage.

Operations are stressed by the Society, and a unique prototype control systems has been installed by John Whittler of Flight Control Division.

Currently underway is a main-line relocation project, which for the time being, limits Sunday afternoon operations. Sunday operations from 3 to 6 pm should resume about May 7.

"Anyone who wants to see a model railroad system at work," said Eubanks, "is invited to come up to the club facilities and see why model railroading is fun."

Correction

The April 14 *Roundup* carried an MSC Credit Union story which outlined a new Credit Union policy which provides for a charge of \$.50 for each withdrawal in excess of one per month. The word *share* was inadvertently used, inferring a \$5 share withdrawal.

The policy, restated, is as follows: A charge of \$.50 will be made for each withdrawal in excess of one per month.

Whether \$1 or \$100 is withdrawn, then, the charge will be made if a previous withdrawal has been made in the same month.

Alvin College Has Three Spaces for Nurse Instructors

Wives of MSC employees who are professional registered nurses may be interested in three openings for nursing instructors in the Nursing Education Department of Alvin Junior College for the 1967-68 school year.

Other wives desiring to learn the nursing profession will be interested in the Associate Degree in Nursing Education offered by the college leading to eligibility to take the Texas State Board of Nursing registered nurse examination. Texas has reciprocity with other states in RN licensing.

The Alvin Junior College nursing program runs 23 consecutive months, and includes student nurse clinical laboratory work at Galveston County Memorial Hospital. For further details and college catalogs, write Mary Alice Metcalfe, Director, Associate Degree Program, Alvin Junior College, Alvin, Texas 77511.

AVCO to Study Venus Fly-by

AVCO Space Systems Division, Lowell, Mass., has been selected by the Jet Propulsion Laboratory, Pasadena, Calif., to conduct a study on the feasibility of sending a fly-by spacecraft and atmospheric entry capsule to Venus in 1972.

Selection of the firm which heads a team effort with Northrop Systems Laboratories, Hawthorne, Calif., has been approved by NASA. The six-month study is expected to begin in May under a contract to be worth about \$240,000.

Under terms of the contract now in negotiation, the industrial firms will investigate all aspects of launching a Mariner class spacecraft to Venus. At the planet a capsule system weighing 100 pounds or more would separate from the fly-by portion of the spacecraft and enter the Venusian atmosphere to take direct measurements during descent to the surface. The capsule will not be designed to survive impact on Venus.

Other guidelines for the study include use of Atlas-Centaur as launch vehicle and an approximate overall spacecraft weight of 1,200 pounds.

Current flight projects in the NASA/JPL Planetary Exploration Program are Mariner Venus 1967 and Mariner Mars 1969. Both are fly-by missions with no atmospheric entry system. NASA also plans a Mariner fly-by mission with atmospheric entry capsules to Mars in 1971. Voyager missions with orbiting and soft landing capability are planned for the 1970s with the first launch to Mars in 1973.