

Mueller outlines future Apollo lunar objectives

Testifying before the Senate committee on Aeronautical and Space Sciences, NASA Office of Manned Space Flight associate administrator George E. Mueller outlined the objectives and landing sites for Apollo missions beyond the first manned lunar landing.

Apollo 12 is scheduled to land at Site 7 in the Ocean of Storms, and a possible added bonus will be the inspection of the Surveyor III spacecraft which soft-landed within the ellipse on April 20, 1967.

Landing sites spelled out by Mueller for subsequent Apollo landing missions were: Apollo 13 to a highland region near the Fra Mauro formation; Apollo 14 to highlands near the crater Censorius; Apollo 15 to the Littrow area characterized by dark volcanic material; Apollo 16 to crater Tycho, site of Surveyor VII landing; Apollo 17 to the Marius Hills region with its many volcanic domes; Apollo 18 to Schroter's Valley to scout possible transient events and red flares sighted in the area; Apollo 19 to the Linear Rille to determine whether or not it is of volcanic origin; and Apollo 20 to

Orbiting lab pilots assigned to MSC group

Seven astronauts from the Air Force's Manned Orbiting Laboratory have been reassigned to the NASA astronaut program and an eighth has been transferred to MSC's Flight Crew Operations Directorate.

The seven new crewmen are: Major Karol J. Bobko, USAF, 32, Seaforth, New York; Lt. Commander Robert L. Crippen, US Navy, 32, Potter, Texas; Major Charles G. Fullerton, USAF, 31, Portland, Oregon; and Major Henry W. Hartsfield, Jr., USAF, 35, Birmingham, Alabama.

Also, Major Robert F. Overmyer, US Marine Corps, Westlake, Ohio; Major Donald H. Peterson, USAF, 35, Winona, Mississippi; and Lt. Commander Richard H. Truly, US Navy, 32, Meridian, Mississippi.

Three of the men will complete studies for graduate degrees before assuming their new duties: Major Bobko, master's degree in astro-physics, University of California; Major Hartsfield, master of science, University of Tennessee; and Major Peterson, doctorate in physics, University of Tennessee.

Lt. Col. Albert H. Crews, USAF, Alexandria, Louisiana, has been assigned to FCOD. In addition to his MOL training, Col. Crews was trained for space flight in the Air Force Dyna Soar Program.

Three groups of pilots were selected for the MOL program in 1965, 1966 and 1967.

the crater Copernicus to examine deep-seated material ejected when the crater was formed.

Mueller also told the committee that ways of improving space suit mobility and portable life support system lifetime are under study. He also outlined modifications to the lunar module extend lunar stay times and to make the spacecraft more habitable.

Tranquility Base seismic package turned back on

The passive seismometer experiment package left at Tranquility Base by lunar landing crewmen Neil Armstrong and Buzz Aldrin Tuesday was awakened by a radio command from Mission Control Center. The wake-up alarm was sent at 1 am August 19 to end the package's 16-day sleep during the lunar night.

Sunrise at Tranquility Base was at 5 am CDT August 18, but the package transmitter was allowed 20 hours to warm up before it was turned on to begin transmitting data. Temperatures recorded after turn-on averaged 43° F on the thermal control plate.

The package power system was operating normally and the seismometer was commanded on. Downlinked data showed a quiet period of lunar seismic activity. The device will continue to monitor and relay to earth data on lunar seismic events and will be shut down at lunar sunset on September 1.

Lunar surface temperatures during the package's sleep reached -250° F, but the package remained above -60° F through two 15-watt radioisotope heaters attached to the thermal control plates.

Dr. Garry Latham of Lamont Geological Observatory is the principal investigator for the experiment.



LUNAR MATERIAL FRAGMENTS FROM APOLLO 11 SECOND BOX SIFTED

An anonymous hand sifts particles of lunar material from the second Apollo 11 sample return container inside one of the cabinets in the Lunar Receiving Laboratory's bio-prep lab. Unlike the first box which was opened in a vacuum near that of the lunar surface, the second box was sorted and cataloged in a nitrogen environment.

ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



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AUGUST 22, 1969

Eagle's crew praises equipment, says lunar EVA 'pleasant period'

Man's ability to walk and to do useful work on the lunar surface proved to be easier than had been predicted, according to Apollo 11 lunar landing crewmen Neil Armstrong and Buzz Aldrin.

Speaking at an August 12 press conference at MSC, the Apollo 11 crew described their history-making experience.

"A number of experts had predicted that a good bit of difficulty might be encountered by people attempting to work on the surface of the moon due to the variety of strange atmosphere and gravitational characteristics," said

Armstrong. "This didn't prove to be the case, and after landing, we felt very comfortable in the lunar gravity. It was preferable both to weightlessness and to earth gravity."

Aldrin added, "We did find that mobility on the surface was in general a good bit better than perhaps we had anticipated it. And, as one would lean a slight bit to one side or the other, it was very easy to sense when a loss of balance was approaching.

"I found that a standard loping technique of one foot in front of the other worked out quite well as we would have expected. One could also jump in more of a kangaroo fashion—two feet at a time. This seemed to work, but without the same degree of control. We found that we had to anticipate three to four steps ahead in comparison with the one or two steps ahead when walking on earth."

Armstrong described the entire lunar surface EVA as a pleasant period and praised the faultless operation of both Eagle and the portable life support system backpacks that he and Aldrin wore during the EVA. "We had no cause for concern at any time with the operation of that equipment. The primary difficulty that we observed was that there was just far too little time to do the variety of things that we would like to have done," said Armstrong.

When a newsman asked Armstrong if "there was ever a moment on the moon where either one of you were just a little bit spellbound by what was going on," Armstrong shot back, "About two-and-a-half hours!"

Sleeping in Eagle's cabin turned out to be a bit uncomfortable, for when the window shades were drawn, the cabin temperature dropped and made sleeping difficult.

The ascent of Eagle's upper stage from the lunar surface into lunar orbit was "a great pleasure", according to Armstrong. "It was very smooth. We were very pleased to have that engine light up."

Eagle's ascent to orbit and subsequent rendezvous with command module Columbia — manned the entire time by the most solitary human since Adam, Michael Collins — went off without a hitch. Collins said that Eagle "came up from below absolutely as if they were riding on a rail."

Lee replaces Hage as mission director

Chester M. Lee has been named by NASA as Apollo mission director for future manned moon landing flights, including the Apollo 12 mission scheduled for launch November 14.

Lee succeeds George M. Hage, who has returned to the Boeing Company as vice president-product development.



STEEL-DRIVIN' MAN NEEDS BIGGER HAMMER

Apollo 11 lunar module pilot Buzz Aldrin drives a core tube into the lunar surface using the geological hammer with a handle extension. The solar wind composition experiment hangs windowshade-like from the support stand immediately behind the core tube. The experiment's foil sheet was rolled up and returned to the Lunar Receiving Laboratory for analysis.



JOAN ALDRIN SPEAKS WITH MSC SUMMER AIDES
Wife of Apollo 11 LM pilot Edwin Aldrin addresses a group of students employed by MSC for the summer. Her talk on "Life as an astronaut's wife" was followed by a lively question and answer period.

Your Job in Focus

Retirement Benefits

The Civil Service Retirement Act provides a retirement system for Government employees. This law, with amendments, gives retirement coverage to practically all full-time Government personnel except those with temporary appointments. Your latest copy of SF-50, "Notification of Personnel Action," will indicate your retirement coverage, or otherwise.

Your contribution to the cost of the retirement system is 6½ percent of your biweekly pay. This amount is automatically deducted from your biweekly pay check. When you retire, you receive an annuity paid in monthly installments.

If you leave Government service before you have worked 5 years, you have no right to a future annuity, but your deductions will be refunded to you upon application.

If you leave Government service after you have worked 5 years or more, you will be entitled to a future annuity at age 62. In addition, you have a choice of having your deductions returned or leaving the money in the retirement fund. However, unless the amount of the refund is redeposited before you retire, the service covered by the refund cannot be counted in determining the amount of your annuity.

Retirement is automatic at age 70 after 15 or more years of service. You may retire under the following conditions with no reduction in annuity:

- a. At age 55 after 30 years of service.
- b. At age 60 after 20 years of service.
- c. At age 62 after 5 or more years of civilian service.
- d. After 5 years' creditable civilian service, regardless of age, if you have an accident or illness which leaves you too disabled to do your work or other work to which you may be assigned. Disability retirement must be approved by the Civil Service Commission on the basis of a medical examination.

You may also retire under the following circumstances if you are separated involuntarily. How-

ever, if you are under age 55, you will retire on a reduced annuity:

- a. After 25 years of service, regardless of age.
- b. After 20 years of service at age 50.

Your basic annuity is computed on the basis of length of service and "high-five" average salary. Your "high-five" average salary is the highest average basic salary you earned during any five consecutive years of service. Your basic annuity may be reduced because of retiring before age 55, or by choosing to name a survivor annuitant, or by failing to deposit for service during which no deductions were taken from your salary. It will not be reduced for age, however, in cases of disability retirement.

Two formulas are used in computing annuities:

1. 1½ percent of your high-five average salary times 5 years of service, plus 1¾ percent of your high-five average salary times years of service over 5 and up to 10, plus 2 percent of your high-five average salary times years of service over 10; or

2. A substitute formula of 1 percent of your high-five average salary, plus \$25.00 for each year of service. This substitute formula is used in figuring any or all parts of the first formula whenever it will produce a higher rate of annuity. Its use produces a higher rate of annuity only in the lower salary ranges.

If you die in the service, your widow will get an annuity provided you have had at least 5 years of civilian service. Her annuity will be 55 percent of an annuity based on your high-five average salary and years of service. No reduction is made in the computation because the employee may have been under age 55 at time of death. This annuity is payable upon the death of the employee and no age requirement has to be met by the widow. Your dependent children will also be entitled to annuities if you die in the service and their annuities may be figured in one of two ways:

1. If there is a surviving parent, each child will receive an annuity of 40 percent of the em-

Mayer to receive AIAA flight award

Mission Planning and Analysis division chief John P. Mayer has been named by the American Institute of Aeronautics and Astronautics to receive the 1969 AIAA Mechanics and Control of Flight award.

Mayer will receive the award at the AIAA Guidance, Control and Flight Mechanics Conference at Princeton, N. J. August 18-20.

The award cites Mayer "for his outstanding leadership in pioneering flight mechanics studies, trajectory and maneuver planning, and development of real-time analysis techniques which have contributed so decisively to the success of all United States manned spaceflights, including Apollo 8, the first manned lunar orbit mission."

Organists meet each Tuesday

The MSC Organ Club meets each Tuesday evening from 7:30 to 8:30 in the Carter Music Co. building, third floor, 1201 Leeland.

For further information contact Clint Wells, X3803, or LaVerne Hansen, X5421.

The meetings include theory lessons and a question and answer session. A new musical arrangement is studied each week.

employee's high-five average salary divided by the number of children. However, the annuity to any one child is limited to \$636.00 a year and the total of all children cannot exceed \$1909.80 a year.

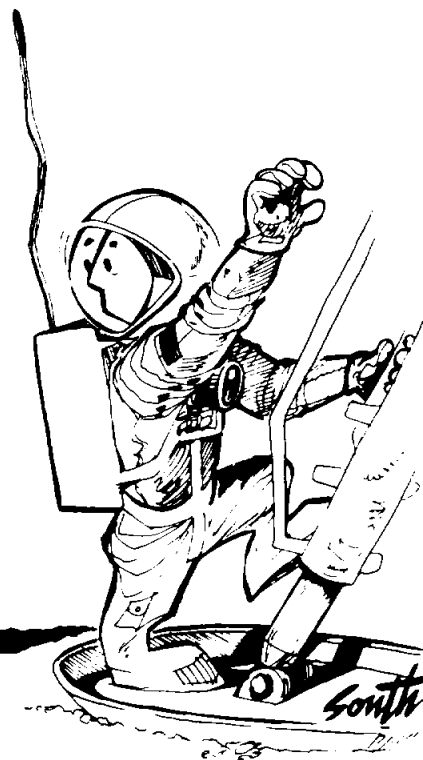
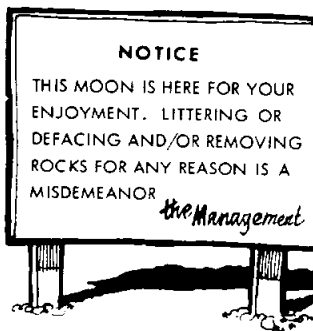
2. If no parent survives, each child will be an annuity of 50 percent of the employee's high-five average salary divided by the number of children. However, annuity to any one child is limited to \$763.92 a year and the total to all children cannot exceed \$2291.76 a year.

A child's annuity terminates when he marries, reaches age 18, or, if a student, reaches age 22.

Additional information on retirement may be obtained from the Placement Section, extension 2135.

THE ASTRONUTS

(filched from TRW Systems Group)



ROUNDUP

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U of H offers 20 courses in Clear Lake fall term

The University of Houston has announced that twenty courses will be offered at the Clear Lake Graduate Center during the 1969 Fall Semester. Registration for these courses will be held on September 5, in the Public Information Briefing Room, Building 1, from 9-11:30 am and 1-3:30 pm. Late registration and registration for combination students (those taking courses both on the main campus and at Clear

Lake) will be held September 12 from 9-11:30 am.

MSC employees who wish to enroll for fall semester courses at Clear Lake or on the main campus should submit MSC Form 75 (Application for Training) to the Employee Development Branch, BP3, no later than August 29.

Following is a list of courses with days and times that they will be offered. Classroom locations will be announced at registration.

1969 Fall Semester Courses

MSC-University of Houston Clear Lake Graduate Center

COURSE NO. and TITLE	TIME and DAYS
EE 632A - Statistical Communication Theory	4-5:30 p.m. (M-W)
EE 561 - Theory of Switching Circuits	4-5:30 p.m. (T-Th)
IE 363 - Engineering Statistics I	7:30-9:00 a.m. (T-Th)
ME 561 - Gas Dynamics I	4-5:30 p.m. (M-W)
ME 660 - Introduction to Advanced Dynamics	7:30-9:00 a.m. (M-W)
ME 690 - Engineering Analysis I	7:30-9:00 a.m. (T-Th)
ME 730 - Finite Elements in Structural Analysis	4-5:30 p.m. (T-Th)
ME 730 - Orbit Determination	4-5:30 p.m. (M-W)
ME 730 - Fundamentals of Trajectory Analysis	4-5:30 p.m. (T-Th)
Math 631 - Theory of Functions of a Complex Variable	4:30-6:00 p.m. (M-W)
Math 667 - Point Set Topology	4:30-6:00 p.m. (T-Th)
Math 683 - Selected Topics in Analysis	3-4:30 p.m. (T-Th)
Math 685 - Selected Topics in Applied Mathematics	3-4:30 p.m. (M-W)
Math 477 - Advanced Linear Algebra	3-4:30 p.m. (M-W)
Math 431 - Introduction to Analysis	3-4:30 p.m. (T-Th)
Physics 390 - General Astronomy	3:30-5:00 p.m. (M-W)
Physics 667 - Quantum Mechanics	3:30-5:00 p.m. (T-Th)
Pol 387 - Accountability in Public Administration	3-6:00 p.m. (T)
Pol 391 - Policy and Administration	3-6:00 p.m. (W)
PLM 631 - Production and Logistics Management	3-6:00 p.m. (M)

ATS-5 satellite goes into flat spin

The Applications Technology Satellite-5 (ATS-5), now in synchronous orbit over India is in an incorrect spin mode (with spin axis at right angles to that planned) that must be corrected if the spacecraft is to carry out its intended mission.

Project officials at the NASA Goddard Space Flight Center, Greenbelt, Md. say the spacecraft is in excellent condition even in the incorrect or "flat" spin.

ATS-5 was launched from Cape Kennedy, Fla. at 6:01 am CDT, August 12 by an Atlas-Centaur launch vehicle. The

launch vehicle placed the spacecraft on a near perfect trajectory.

The mission of ATS-5 is to test a gravity gradient stabilization system (passive orientation constantly toward Earth, via long booms on the spacecraft) as well as other experiments that may have great impact on air traffic control in the next decade.

Shortly after separation of the spacecraft from the launch vehicle, it was noted that the spacecraft was wobbling around its spin axis. On-board attitude control hydrazine gas jets had to fire 15 times as fast as normal in order to reduce the wobble to within required limits.

As a result, ground controllers decided to fire the satellite's apogee kick motor, which places the spacecraft in synchronous orbit, as soon as ATS-5 reached its first apogee rather than the planned second apogee.

With the firing of the apogee kick motor, ground controllers expected to eject the motor casing about 90 seconds afterwards, long before the spacecraft would be expected to go into a flat spin. However, it went into the spin about 20 seconds after firing and it was impossible to eject the motor without its striking the spacecraft. It was later found that the motor casing would probably strike the hydrazine tanks or tubing that are necessary to right the spacecraft and keep it in its proper orientation.

Lewallen presents paper in Germany

Dr. Jay M. Lewallen, chief of Computation and Analysis Division's Theory and Analysis Office, this week presented a paper entitled "Recent Applications of Regularization Theory to Trajectory Optimization Problems" at the third Colloquium on Mathematical Methods in Celestial Mechanics. The colloquium was sponsored by the *Mathematisches Forschungsinstitut Oberwolfach* (Oberwolfach Mathematical Research Institute) in Oberwolfach, West Germany.

Lunarfin assist museum in ocean floor exploration

Five MSC employees, all part of an organization they call Lunarfin, recently joined scientists and divers from all over the United States in support of the Houston Museum of Natural History and the American Society of Oceanography Survey to collect organic and inorganic specimens from the ocean bottom.

The group gathered their samples along the edge of the continental shelf approximately 120 miles Southeast of Galveston.

Lunarfin members are: Edward L. Beckman, Biomedical Research Office; Hugh M. Scott, Apollo Systems Engineering; James M. Peacock, Apollo Systems Engineering; Fredric, C. Toole, Engineering-Test Facilities; and William F. Moran, Program Control Division.

Ride map shows who and where

For those who would like to start, join or add to a car pool, the Employee Activities Association has established a convenient ride map.

The map, located in Cafeteria #1, has each section of Houston and the surrounding area clearly marked and coded.

Small printed forms are provided for the prospective car pooler to indicate his area, name, phone and whether he wants to ride or drive.

Under the supervision and direction of Dr. Beckman, decompression dives were made to great depths to recover bottom material and specimens from an area that only divers are able to reach.

According to Dr. T. E. Pully of the Houston Museum, it will take months to catalog the discoveries of this expedition. The group's last trip resulted in the discovery of over 350 new species of mollusk.

Picnic goes west; y'all come, hear?

Levis, Stetsons and boots will be the uniform of the day October 18 when the MSC Employee Activity Association annual picnic gets underway at Galveston County Park in League City.

The picnic will start at 10 am and run to 6 pm; food will be served from 10 am to 3 pm. The menu includes barbecue with all the usual trimmings and a variety of drinkables.

Music, fun and games for all ages are planned.

The EAA urges all MSC employees to wear the western duds Friday, October 17 to help promote picnic attendance the following day. Tickets shortly will be on sale through EAA representatives at \$1.50 for adults, \$1 for kids 7-13 and \$.50 for tots 1-6.

news from around



MARSHALL—Pegasus C, the third meteoroid technology satellite launched by a Saturn I rocket, has reentered the Earth's atmosphere ending four years in orbit.

The satellite entered over the Indian Ocean on August 4, after serving more than double the design lifetime. Pegasus A and B are still in orbit.

LOCKHEED—Brig. Gen. Spencer Hunn, North American Defense Command, reports 1680 operational satellites in space—and the number is testing the Air Force's ability to monitor them.

"The space environment has grown quite rapidly," said Hunn, "and we have got to expand our computerized capability to take care of the increased number of satellites."

Roundup Swap-Shop

(Deadline for Swap-Shop classified ads is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 15 words, including name, office code and home telephone number. Send ads in writing to Roundup Editor. AP3. Ads will not be repeated unless requested.)

REAL ESTATE

Pearland, 1 3/8 acres, corner, small pines, residential development, sacrifice \$4000, Plauche, 474-2660.

West Galveston Island Beach House, gulf view, all electric, 1 block to water, sell or rent, Green, 932-3486.

Taylor Lake corner lot, wooded, lake view, \$1000/down, balance at 7%, owner, 591-4632.

Nassau Bay 4-2-2, fenced, assume 6% loan, X7256.

West Galveston Island (Spanish Grant) house for rent, 3-2, air furnished, gulf view, \$175/wk, J. Small, 591-5817.

Friendswood 3-2-1 for sale or lease, clean, built-ins, central air, carpets, 6% VA, low equity, 877-3028.

Nassau Bay Colonial, 3-2-2, fenced, corner, formal living & dining, fireplace, assume 5 3/4%, 591-2340.

Clear Lake City 4-2-2 for lease, family room, central A/H, membership in recreation center, \$260, 733-7667.

El Lago Brick Colonial 4-2-2, wooded, fenced, 6 1/4%, Zarcara, 877-4096.

Lakeview, near Austin, golf course lot in Lago Vista on Lake Travis, B. Berleth, X3821.

Seabrook 4-2-2 brick, 6 1/2% loan, \$172/mo, 474-2309, 474-3773.

AUTOS

66 Porsche 911, 14,000 mi, new radial tires, AM/FM, deluxe interior, \$1550, J. Sutton, 932-3979.

68 gold GTO, automatic, air, AM/FM

stereo, \$2850, S. Spaeth, 944-3170 after 5.

62 Corvair Monza interior & exterior body parts, hub caps, tinted glass, Liddell, 471-4448.

64 Corvair Monza, automatic, factory air, radio, buckets, low mileage, excellent cond, \$525, L. Stevens, 591-4652.

64 Dodge Dart station wagon, new re-built motor & tires \$550, 932-5420 after 4:30.

66 Mustang, 289, automatic, air, AM/FM, discs, power steering, positraction, delux interior, A. Glines, 944-9491.

63 Impala, 2-dr HT, blue w/white top, good cond, \$1000, 932-2065.

62 Ford station wagon, air, automatic, J. Llewellyn, 482-1506 or 483-2468.

57 Chevy, good work car, 4-dr, standard, \$135, consider trade, 733-7667.

63 V W sedan, good cond, Linsan, 483-2153, nights 482-7388.

63 VW sunroof, 575, Cornelius, Baytown, 575-1248.

65 VW, a steal for \$700 cash (\$245 under Blue Book), V. Mason, 591-2707.

67 MGB, excellent cond, wire wheels, radio, tonneau, \$1775, or 932-4368.

60 Ford truck, engine 223, 20,000 mi, clutch, transmission, complete, running \$75, L. Kaigler, 877-4731.

68 Dodge Dart, 6 cyl, standard, 2-dr, \$200, equity, 21 payments, \$63.49, 485-3084 after 5.

65 Chevy suburban carryall, 6 cyl, standard, 40,000 mi, excellent, E. Thomas, League City, 932-4787.

50 Dodge pick-up recent overhaul & paint, no rust, excellent cond, \$250, 645-7093 after 5:30.

64 VW, blue, sunroof, vinyl, AM/FM, air, excellent, \$750, 523-3181.

63 Ford pick-up, radio, air, standard, excellent cond, \$750, 649-3992.

56 Plymouth station wagon, V-8, standard, \$125, C. Lewis, 932-2949.

62 Ford pick-up, 3/4 ton (F250), V-8, 4 speed, overdrive, extra gas tank, radio, real clean, M. Lausten, 482-1004 after 5.

65 Corvette Coupe, 365, air, power brakes & windows, new polyglass, J. Lewis, 643-2166.

BOATS

191 1/2' ob day cruiser w/trailer, fiberglass hull & decks, excellent cond, \$750, engine not included, W. Mallary, 482-7081.

Lido 14, orange deck, white hull, trailer, life preservers, excellent cond, \$990, R. Wilson, 591-3886.

69 19' Thunderbird Comanche deluxe, less than 20 hr on 160 M. Cruiser, R. Burt, 591-2117.

15' fiberglass boat, 50 hp Evinrude, trailer, skis, life jackets, \$700, J. McAnulty, 534-3792, Dickinson.

12' Aquacat class sailboat, w/new, large racing sail, dacron deck, 2 yrs old, \$600, W. Hess, 877-2187.

12' V-bottom Ouachita aluminum boat, 4 hp McCullough motor, 1 yr old, both items for \$200, W. Hess, 877-2187.

Deckboat, 20', fiberglass, catamaran hull, excellent cond, \$1270, J. Bone, 471-3528.

HOME FURNISHINGS

Set springs & mattress, \$15. 9 X 12 braided rug, \$15; 4 rattan bar stools, \$20 each; 534-3297.

Apt size stove, \$50; apt size refrigerator, GE, 1968, \$100; M. Banks, 877-4956.

Baby crib w/mattress, good cond, \$25, A. Rochford, 649-5768.

Baby Grand piano, new bass strings, \$300, R. Wessinger, 946-4609.

ENTERTAINMENT

2 Allied stereo 12" speakers, walnut cabinets, \$70 each, S. Spaeth, 944-3170 after 5.

Roberts model 770 4-track stereo recorder, 2 mikes, input-output patch cards, good cond, 150, E. Walters, 649-2838.

VOX Super-Beagle Piggyback Amplifier model V-1141, replacement cost \$1523, good cond, \$695, J. Weber, 944-3256.

Full membership in Clear Lake Country Club, greatly reduced for limited time, 488-2206 after 5.

Technical Movie Club membership,

equipment: Super-8 camera, projector, lights, screen, film, processing, \$550 new, sacrifice \$400, 645-1001.

Gibson tenor banjo, model TB-100, \$175 w/case; Gretch hollowbody electric guitar, \$125 w/case, Craig, 946-5127 after 5.

Surfboard, 9' 6" fiberglass Newporter, \$40, E. Thomas, League City, 932-4787.

Gemeinhardt flute, excellent cond, \$125, J. Bone, 471-3528.

21 1/2' "Leisure time" travel trailer, tandem, self contained, sleeps 7, mos old, \$3400, 944-3586.

PETS

German Shepherd puppies, AKC, see after 5 at 3632 Federal St, Pasadena, Texas.

Pure-bred Dachshund puppies, 8wks old, lovable, demand lots of TLC, F. Morphew, 935-6322.

German shorthaired pointers, 3 mos old, AKC champion sired, top quality for show or field work, R. Reining, 946-6396.

Basset puppy, 3 mos old, AKC, good blood lines, 643-1611.

MISCELLANEOUS

Mooney M20A, 1550 TT, 600 SMOH Genave Navcom, good paint & interior, \$5950, D. Friis, 944-5000.

Will fly persons on weekend for cost, F. Blankenship, 944-0750.

Fancy boots, 9N, new, \$15; 15" speaker cabinet, \$5; calendar watch, \$15; reg 8mm editor/viewer, \$5; R. Lindemuth, 482-1086.

Set springs & mattress, \$20; girls' 24" bike, chrome table & 4 chairs, \$50; champion AKC poodle, \$100, 534-5369.

Fly retractable w/Areo Club, Inc., for MSC & contractors, P & K Bonanzas, ITF, 195 mph, \$17/hr wet; Cessna 172 \$9/hr, 150 \$8/hr; instructor \$5/hr, B. Ward, 877-3187.

Radios: 50 Chevy, \$10; 62 Corvair, \$20; transistorized Allstate, under dash, 10, Liddell, 471-4448.

Various calibres military rifles, some sporterized, some original w/matching serial numbers, L. Kaigler, 877-4731.

357 Mag Ruger w/scope & specially made holster, Lee loader equipment, \$165, 932-5420 after 4:30.

Model 60 Harley-Davidson, windshield, saddle bags, new tires & exhaust system, \$700, 932-5420 after 4:30.

Bathenette, playpen, car seat, L. Hayman, 487-0278.

Large chain saw, Sears, good cond, \$45, K. Thoma, 471-2976.

Fencing foil & mask, excellent cond, \$7.50, Burch, 483-5566.

Horse & harness, \$225; piano, \$250; boys' & girls' bicycles, \$5 each; P. Maloney, 482-7688.

York compressor & clutch assembly for auto air conditioner; saber saw w/tilt base: small oscillating sander; Smokey Dan barbecue pit, W. Brentan, 488-4372.

Upright typewriter, like new, \$60; adding machine, \$30; 7 X 35 binoculars, new, \$20, 649-2569.

Electric motors, F. H. P. \$10 each, Liddell, 471-4448

WANTED

Throw away "junk" TV, Hi-Fi components, etc, will pick up, J. Samouco, 488-0406.

Ride from Gulfgate to Ellington, 8 to 4 shift, N. Scott, 483-7283.

Female roommate to share Bay House apartment, 2-1 1/2-2, C. Critzos, 483-3558 or 488-2193 9 to 5, 591-2271 after 6.

65 66 or 67 Mustang or Chevelle, must be in good cond, J. McCown, 471-0716.

26" to 28" boys bike, standard type, no gears or fancy equipment, L. Smith, 487-3434.

Pattern for Barbie Doll wedding gown, Weaver, 932-2371.

Used room air conditioner, about 1 ton, D. Greenwell, 488-1034.

Speed bike, K. Lumpkin, 474-4046.

FOUND

Man's beige raincoat, label "Plymouth of Boston" left in office of CSM manager, bldg. 2, room 75, X3558

THOMAS JEFFERSON

"The God who gave us life, gave us liberty at the same time." Summary View of the Rights of British America.

Buy U.S. Savings Bonds, new Freedom Shares

AAP revamped to use Saturn V to orbit "dry" science workshop

Following the Apollo lunar landing program, the next phase of the manned space flight effort is the Apollo Applications Program (AAP). The AAP is to make maximum use of the hardware and techniques developed in the Apollo program to explore further and extend man's usefulness in space.

The two main spacecraft elements in AAP are the Saturn V workshop and a manned solar observatory known as the Apollo Telescope Mount.

NASA plans to launch its first orbital workshop in 1972 using the first two stages of the Saturn V as the launch vehicle. Use of the first two stages of the Saturn V will permit full outfitting of the workshop on the ground and will permit the launching of the workshop with Apollo Telescope Mount attached into a 220-nautical-mile circular orbit.

NASA previously planned the use of a second stage of the Saturn IB as its first orbital workshop. After its initial use as a propulsion system to reach earth orbit, the spent stage was to have been prepared by the astronauts while in orbit for the conduct of scientific and biomedical experiments. The Apollo Telescope Mount was to be launched by another Saturn IB, with automatic rendezvous and docking to the workshop after arrival in orbit.

NASA now plans to use the launch capability of the larger Saturn V to launch the workshop and the ATM together. The workshop will be outfitted on the ground, and will arrive in orbit for immediate occupancy by the astronauts.

Basic program objectives remain the same as those originally announced. The purpose of the workshop is to provide an environment in which man can live and work under controlled conditions for extended periods of time in space beyond that provided by Gemini and Apollo.

The experiments will study man's physiological and psychological responses in the space environment and provide more detailed information on his capabilities for extended manned flight.

The Apollo Telescope Mount will permit man to conduct astronomical observations under conditions free from optical interference of the earth's atmosphere, and will provide a platform to demonstrate man's ability to perform scientific experiments in space by operating high resolution astronomical telescopes.

Launch Sequence

The Saturn V workshop will be launched unmanned from Complex 39 at NASA's John F.

Kennedy Space Center, Fla. About a day later a three-man crew will be launched in an Apollo spacecraft atop the smaller Saturn IB vehicle from Complex 34 at KSC.

The spacecraft will rendezvous and dock with the workshop and occupy it for up to 28 days, during which time ATM experiments will be conducted. The spacecraft will then return the three-man crew to earth.

Two revisits of up to 56 days duration each are planned. Saturn IB vehicles will launch the Apollo spacecraft on these revisits. Orbital lifetime of the workshop is expected to be about eight months.

Aside from the ATM and Workshop, the AAP cluster will include an airlock module, which will permit the crew to exist without depressurizing the workshop, and the multiple docking adapter, which permits the joining together of these elements into a single unit in space, together with the Apollo command and service modules (CSM).

The total AAP cluster, excluding the Apollo CSM which is to be launched on a separate vehicle, will weigh about 130,000 pounds. All elements to be launched by the Saturn V are being furnished by the NASA-Marshall Space Flight Center, while MSC is providing the CSM.

Saturn V Workshop

The Saturn V workshop is a modified S-IVB stage which will have its 10,000 cubic-foot hydrogen tank equipped to offer living and working areas for three astronauts for periods of up to 56 days.

The workshop design will remain substantially the same as that previously planned for the Saturn I workshop. The principal difference is that the workshop can be launched with all the equipment in place. Previously, most of the "furniture" and equipment for the stage was to be launch-stowed in containers in the multiple docking adapter. Now that the workshop will be completely outfitted before the launch, this makes the MDA space available for other purposes.

S-IVB number 212 will be the primary flight hardware, with S-IVB-210 as the backup. The stage's engine and other propulsive hardware will be removed.

Experiments being considered for the first workshop flight are divided into several groups including scientific, technological, applications operation and medical.

McDonnell Douglas Astronautics Co., Huntington Beach, Calif., is manufacturer of the S-IVB stage and will outfit the workshop. McDonnell Douglas also makes the airlock module.

Apollo Telescope Mount

The Apollo Telescope Mount (ATM) or manned solar observatory is being developed to give space scientists a look at the sun's activity undistorted by the fogging effects of the earth's atmosphere.

The ATM will be attached at the forward end of the workshop and launched integrally with the workshop thus making it available for use throughout the workshop operation.

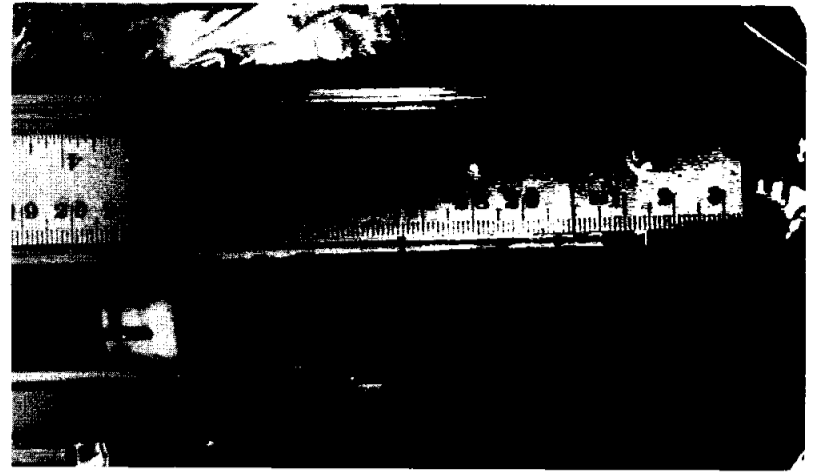
The ATM design changes significantly from the previously announced plan. The Lunar Module ascent stage has been eliminated and the ATM telescope "rack" sits directly on top of the multiple docking adapter, in launch configuration. It is mounted on pivot arms atop the MDA, and in orbit (after removal of the payload shroud) the ATM swings around 90 degrees to its deployed position.

After the ATM swings to the side, the CSM docks in the end port of the MDA.

The ATM control panels, located in the lunar module ascent stage in the earlier design concept, are now located in the multiple docking adapter.

Five principal investigators, all experts in astronomy and solar physics, have designed five experiments for the first ATM flight. The eight instruments used in these five ATM experiments will obtain measurements of the sun in the extreme ultraviolet and X-ray portions of the electromagnetic spectrum, which cannot penetrate the earth's atmosphere, and obtain pictures of the sun's corona in the white light portion of the spectrum.

(Continued Next Issue)



A SLICE OF THE MOON UNDER GLASS

Geologists in the MSC Lunar Receiving Laboratory gingerly remove one of two lunar surface core samples from the core tube brought back in the Apollo 11 lunar surface return containers. (See photo, page 1, showing core tube being driven.) Later lunar landing missions will use a powered core sample drill for collecting deeper core samples.

NASA revises program for quality assurance

NASA has published a new edition of the quality program requirements which must be met to ensure the high quality of NASA aeronautical and space systems.

The manual requires all NASA contractors to maintain an effective program of quality assurance beginning with the preliminary design of a system and continuing through actual flight operations.

It requires the contractor to maintain a complete set of technical documents to be rigidly followed during all phases of contract work; establishes standards for the selection of subcontractors and the high quality of their material; lists fabrication and assembly controls; and defines the inspection and test program which the contractor must conduct on his product before government acceptance.

The manual, "Quality Program Provisions for Aeronautical and Space System Contractors," supersedes the April 1962 edition. The new number is NHB 5300.4(1B) April 1969. The

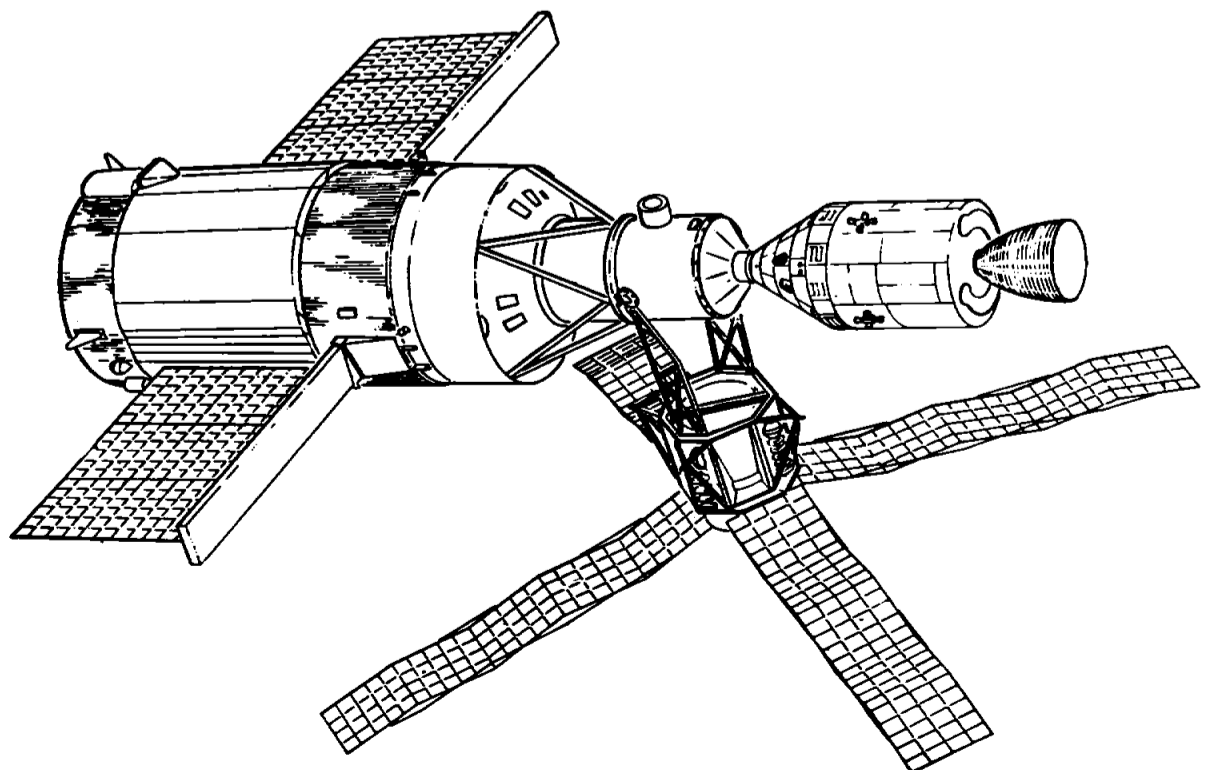
manual is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price is 55 cents.

Scientist-pilots go to jungle training

How to make sonofagun stew from lizard and other jungle critters will be part of the syllabus next week when eight scientist-astronauts undergo jungle survival training at the USAF Tropic Survival School at Albrook AFB, Canal Zone August 25-29.

The training will include three days of classroom instruction and a two-day jungle survival field trip in which three-man groups set up camps simulating Apollo crew contingency landings in jungle terrain.

Attending the training are Joseph P. Allen, Philip K. Chapman, Anthony W. England, Karl G. Henize, Donald L. Homlquest, William B. Lenoir, F. Story Musgrave and Robert A. Parker.



EARLY SPACE STATION CONCEPT INTEGRATES TELESCOPE MOUNT
Man's response to extended stays in space will be studied in AAP's workshop