

A SWIM IN THE CHAGRES, A TREK THROUGH THE JUNGLE, A YUMMY PARROT FOR DINNER—SURVIVAL TRAINING

Astronauts Carl Henize and Anthony England were among nine participants in the US Air Force Tropic Survival School held August 25 through 29 in the wilds of Panama, near the Chagres River. The men were given one day of field instruction and one day to "make it" on their own. Barracks consisted of pole platforms lashed up off the ground with bark and covered with palm boughs and parachute cloth. In addition to Henize's parrot, the bill of fare included such delicacies as Tucan, Yucca root and Monkey plums.

Lunar samples undergo further scrutiny in lab

Measurements of gases in Apollo 11's lunar samples have recently been made in the Lunar Receiving Laboratory by Dr. Oliver Schaeffer and Dr. John Funkhouser of State University of New York, Dr. Joseph Zahringer of the Max Planck Institute, Heidelberg, Germany, and Dr. David Bogard of MSC.

The rare gases, found by using mass spectroscopy, indicate that the lunar material was formed early in the history of the solar system and is as old as the oldest rocks in the Earth's crust.

The rare gases also indicate that some of these rocks have been exposed to cosmic rays on the surface of the Moon for up to hundreds of millions of years.

Most of the material returned from the Moon aboard Apollo 11 contains large amounts of solar wind gases.

These gases are essentially boiled off from the Sun and are caught in the crystal lattice of the lunar material.

The Earth's magnetic field keeps the relatively low-energy solar particles away from the Earth. However, the Moon, without a magnetic field, allows the particles to be captured.

Several crystalline rocks from the Moon have been found which contain considerably less solar wind particles than most of the material studied so far.

In these rocks the decay products from natural radioactive elements as well as the cosmic-ray-produced nuclei, are clearly identifiable and are not overshadowed by the solar wind particles. Thus

the investigators are able to estimate certain ages.

These age estimates are important in understanding the origin of the Moon and the solar system.

An estimated age of billions of years for the crystalline rocks indicates that the Sea of Tranquility was formed early in the history of the solar system.

Trimble, Phillips leave NASA;

Petrone moves up

George S. Trimble, deputy director of MSC since 1967, will leave his post effective September 30.

In making his plans known, Trimble said that he has made no decision as to future employment. No replacement has been named yet to the position of deputy director.

"I will miss the people at the Center. I have never enjoyed myself so much as working with such beautiful and talented people. I feel that I have been able to contribute more and get more done in a short period than in any previous assignment," said Trimble.

In Washington, Lt. Gen. Samuel C. Phillips, Apollo Program director since late 1964, has been named Commander of the Air Force Space and Missile System Organization.

Rocco A. Petrone, former director of launch operations at Cape Kennedy, Florida, has assumed the Apollo Program directorship.

Scientists lose control of lunar seismometer

The Passive Seismic Experiment Package left on the Moon by Apollo 11 has not responded to Earth commands since 10 p.m. on August 24 and scientists now fear that a complete shutdown has occurred.

Donald G. Wiseman, project manager at MSC, explained the sequence of events leading to loss of contact with the instrument.

As each lunar day (approximately 14 Earth days) progresses at Tranquility Base, and the temperature rises on that part of the Moon, scientists attempt to control the heat's effect on the seismometer's electronic system.

This is accomplished through a series of "power dumps"—signaling a cutoff in the system's electrical power.

At the last lunar noon, just after a power dump was initiated, the ground lost control of the seismic mechanism and was unable to terminate the power dump sequence.

Then, just before lunar night began, the device automatically shifted into a stand-by mode, stopping all meaningful data yield.

Efforts to reestablish uplink communications with the package will begin again at the end of the current lunar night (about September 16).

"There is still a possibility that we may regain control at that time," said Wiseman.

Last pioneer flies off course

The last in the current series of interplanetary Pioneer spacecraft, Pioneer 10, was launched August 27 at 6:59 p.m. and was destroyed minutes later when a first-stage hydraulics leak caused the vehicle to miss its course.

This final Pioneer launch was to supplement operations of the four preceding Pioneers 6, 7, 8 and 9 in the study of solar processes, the interplanetary medium and the effects of solar activity on the Earth.

This chain of space probes, including Mariners 4 and 5 and three Interplanetary Explorers, is monitoring the high activity period of the 11-year solar cycle, which peaks this year.

"We had a hydraulics problem during the first stage and lost complete hydraulics four seconds prior to first stage shutdown," said Robert Gray, director, unmanned flight operations.

After the loss of hydraulics, which control engine position, the vehicle went out of control.

(Continued on Page 2)

NASA plans sample release

The distribution plan for release of lunar sample material to Principal Investigators representing nine foreign countries, 20 states, the District of Columbia and the Virgin Islands, is presently being reviewed at NASA Headquarters.

Forty-four pounds of lunar rock and dust are expected to be released after the meeting of the Interagency Committee on Back Contamination, now scheduled for September 12.



ENTHUSIASTIC HOUSTONIANS LINE MAIN STREET FOR A GLIMPSE AND A WAVE AT THEIR HEROS

Apollo 11 crewmen and top NASA officials were hailed with wild cheering and tons of confetti as they rode through downtown Houston Saturday, August 16. That evening the City paid tribute to NASA employees and the entire Space Program with an Astrodome variety show.



THREE MSC SUMMER AIDES RECEIVE COLLEGE SCHOLARSHIPS

Eva Filmore, Texas Women's University; Mary Rogers, Texas Southern University; and Keith Griggs, Sam Houston State, each received \$125 toward their college tuitions for their work as MSC Summer Aides. Mark Hepler, administrative assistant to the Mayor, made the presentations. Flora Brinkley, not pictured, will use her scholarship at TSU.

Your Job in Focus

How to convert children's health benefits

Current Health Benefits Program regulations provide for the coverage of enrolled employees' children until they marry or reach the age of 22.

A family member who loses coverage under this ruling has the right to convert, without evidence of insurability, to a non-group health benefits contract offered by the company which underwrites the group plan.

However, Federal Agencies are not expected to monitor conversion rights of family members.

It is the responsibility of the employee (or the person who loses his status as a family member) to apply for a conversion contract if he wishes to do so.

Normally, the application for conversion must be made within 31 days after the event which terminates the person's coverage.

Application for conversion should be made by letter to the nearest office of the plan's company. Questions regarding conversions may be directed to the Administration Section, X7381.

Proper conduct: an individual responsibility

Employees are reminded periodically of their obligation to comply with the NASA regulations regarding standards of conduct.

Each employee should have a copy of the Standards of Conduct for NASA Employees dated October 1967.

This contains the agency rules regarding acceptance of gifts, outside employment, financial interests and investments, as well as other standards relating to Government property, indebtedness, etc.

It prescribes policies for the avoidance of apparent or actual conflicting financial interests in connection with the employee's Government position.

Questions on interpretation of these regulations, or advice in this regard may be directed to the following counselors: Richard Wieland, X4258 (legal matters) or Glen Brace, X6216 (personnel matters).

MSC Bridge Club

now sponsors

two game nights

The MSC Duplicate Bridge Club now sponsors a game on Sunday at 7 p.m. in addition to their regular game on Tuesday at 7:30 p.m.

Both meetings are held in building 336 at Ellington Air Force Base and are open to MSC employees and associated contractor personnel.

A certified director is in charge of the contests and American Contract Bridge League (ACBL) rating points are awarded to the winners. A partner is guaranteed for anyone who wishes to participate in either or both of the games.

Jim Raney, X3281, or John Herrmann, X2395, will provide additional information.

Apollo tape sells for youth center

"Spirit of Apollo", a one-hour tape featuring highlights of the lunar landing mission, is now available through sponsors of the Ed White Youth Center.

Compiled by Radio Station KMSC, the tape covers Apollo 11 from liftoff to the crew's release from the Lunar Receiving Laboratory. It will be sold at the Home Entertainment Center in Nassau Bay Shopping Village for \$5.

Net proceeds from the sale will go to the Ed White Memorial Fund for the building of a Youth Center in Seabrook, Texas.

Pioneer 10 --

(Continued from Page 1)

The second stage started, but quickly lost its attitude and began flying off course, making the destruct action necessary.

In another unmanned launch failure, that of Intelsat 3 on July 25, a reviewing committee has been appointed.

The eight-man committee will attempt to determine why the communications satellite did not achieve its programmed orbit. It will then recommend any corrective actions that may be necessary.

ATM to give scientists undistorted look at Sun

(Continued from August 22)

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 instruments in the ATM experiments are designed to provide high spatial and spectral resolution in the ultraviolet, X-ray, white light and hydrogen-alpha (6,563 angstrom) bands of the spectrum and are particularly concerned with the active regions on the solar disk or in the corona.

The telescopes are mounted in a 7-foot diameter cylindrical structure on their unique optical bench structure.

The five principal experiments are the High Altitude Observatory (HAO) white light coronagraph, the Naval Research Laboratory (NRL) ultraviolet spectroheliograph and extreme ultraviolet spectrograph, the Harvard College Observatory (HCO) ultraviolet scanning spectroheliometer, a Goddard Space Flight Center (GSFC) X-ray telescope and an imaging X-ray spectrographic telescope by American Science and Engineering, Inc.

Principal investigators are Dr. Riccardo Giacconi, American Science and Engineering, Cambridge, Mass.; James Milligan, Goddard Space Flight Center; J. D. Purcell, Naval Research Laboratory, Washington, D. C.; Dr. Leo Goldberg, Harvard College Observatory, Cambridge, Mass.; and Dr. Gordon Newkirk, National Center for Atmospheric Research, High Altitude Observatory, Boulder, Colo.

Four of the five experiments have instrumentation built by private industry. Ball Brothers Research Corp., Boulder, Colo., is manufacturing instruments for the High Altitude Observatory, the Naval Research Laboratory and the Harvard College Observatory experiments and American Science and Engineering is building the equipment for its own experiment.



ARMITAGE WINS FELLOWSHIP

Peter J. Armitage, assistant division chief in Landing and Recovery, has received the 1969-70 Stanford-Sloan Fellowship at Stanford University, Stanford, California. Armitage came to MSC from Langley Research Center in May of 1962.

Power Squadron offers free school

The United States Power Squadron is offering free boating classes to area enthusiasts beginning Wednesday, September 10, 1969 at 7:30 p.m. in Clear Lake City Elementary School.

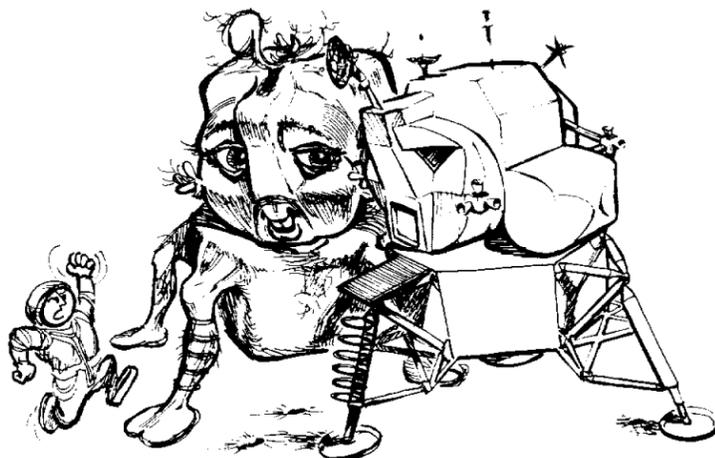
The 10-week course includes lectures on rules of the road, Government regulations, aids to navigation and boating skills for water safety.

There will be no pre-registration and no cost for the course. However, students will be required to purchase a text.

For further information contact Joe Borches, 483-3981 or Harry Jennings, 488-3180.

THE ASTRONUTS

filched from TRW's gordon a. south



ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS



The Roundup is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

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David Pruett
July Co-op



David Beery
August Co-op



Raymond Bartels
September Co-op

Summer Co-ops cited

David Pruett of Computation and Analysis, David Beery of Structures and Mechanics and Raymond Bartels of Space Environment Testing have been chosen for Co-op awards this summer.

July's Co-op, David Pruett, is a senior mathematics major at Texas A&I. He has been in the Simulation Branch of Computation and Analysis since June, 1967 and is currently assigned to the Hybrid Simulation Section.

In the course of his duties, Pruett has styled a series of programs forming "an integral part of the Apollo Reentry Simulation which has been used in mission planning and crew training for the Apollo missions" said Eugene Brock, division chief.

Recently Pruett has been a principal contributor in the development of some generalized analog programming techniques that will be used in planning future space flights.

David L. Beery, August's Co-op, is a junior at the University

of Texas majoring in aerospace engineering. He is assigned to the Flight Loads Section under Structural Dynamics.

Beery is presently working on one of the most complicated and important structural loading conditions for the Apollo Applications missions—calculating three-dimensional elastic loads resulting from the docking and latching of the Command Module with the Multiple Docking Adapter.

His work on a computer program for calculating structural load coefficients is being published as an MSC Working Paper.

"This work has contributed significantly to the organization in alleviating tedious and time-consuming calculations," said George E. Griffith, branch chief.

Raymond Bartels, a mechanical engineering major at the University of Houston, is September's Co-op. He has spent the past three years working in the

(Continued on Page 4)

EBA schedules insurance drive

The Employee Benefit Association has scheduled an enrollment drive during September to register employees who are not currently enrolled in the NASA Group Life Insurance Plan.

All full-time permanent employees, including military personnel assigned to NASA on a three-year detail, are eligible to participate in the Plan.

An important feature of the Plan, life insurance coverage for

dependents, is being offered for the first time.

The NASA Dependents Life Insurance Plan offers wives (or husbands) of employees from \$2000 to \$5000 coverage. Each child receives \$1000 coverage.

All employees were recently furnished descriptive material concerning the Group Life Insurance Plan. Anyone who has not received the material should contact Mrs. Terry Rasberry, X5410.

On September 18 and 19, representatives of the Home Life Insurance Company, underwriters of the NASA Plan, will conduct special meetings to answer questions and provide enrollment assistance. A schedule of meeting locations will be announced shortly.

All employees, whether insured or not, are encouraged to attend one of these meetings.

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

- West Galveston Island beach house for sale or rent, all electric, gulf view, 1 block to water, Green, 932-3486.
- Nassau Bay 4-2-2, fenced, assume 6% loan, Cobb, X7256.
- Taylor Lake, large, wooded corner lot w/lake view, 1/2 block to park & docks, 591-4632.
- Pearland, 1 3/8 acres, corner, 30 small pines, residential development, sacrifice \$4000, Plouche, 474-2660.
- Kemah, Clear Lake Shores, furnished house for rent, 2 bdr, fenced, air, redecorated, 200' from water, \$90/mo to settled couple, C. Schoenberg, 483-2531.
- Bay 3-2-2 for rent, brick, central air, 2 blocks to elem, access to pier & boat launch, \$188, 471-4539.
- Meadowbrook 3-2-2, trees, built-ins, air, equity, 5 1/4', \$110/mo, immediate occupancy, Koons, 591-3616.
- Nassau Bay Colonial, 3-2-2, fenced, corner, formal living & dining, fireplace, assume 5 3/4', 591-2340.
- Twin Lakes, Texas, double lot, 140' X 172', private bass fishing & swimming resort, \$1600, W. Remini, 591-4119.
- Shoreacres 3-2-2, brick, A/H, new carpeting, drapes, bookcases, pier privileges, 6 1/4', consider leasing, 487-2674 after 5 & weekends.

AUTOS

- 65 VW, a steal for \$700 cash, \$245 under Blue Book, V. Mason, 591-2707.
- 64 Dodge Dart station wagon, new rebuilt motor & tires, \$550, 932-5420 after 4:30.
- 68 VW sunroof sedan, red w/black vinyl interior, radio, \$1550, J. Sutton, 932-3979.
- 68 Gold GTO, automatic, air, AM/FM stereo, \$2850, S. Spaeth, 944-3170 after 5.
- 66 Porsche 911, low mileage, new radial tires, AM/FM, deluxe interior, R. Schweickart, 591-2439.
- 62 Corvair Monza interior & exterior body parts, hub caps, tinted glass, 471-4448.
- 62 Pontiac Catalina, radio, air, good mechanical cond, \$250, 487-0442.
- 65 Chevy 3/4 ton pickup, long wheel base, rebuilt engine, new paint, w/or w/out camper, D. McAnelly, 926-7140.
- 63 Chrysler Newport, new starter/battery, brakes recently overhauled, excellent tires, power, air, automatic, radio, \$575, H. Beaty, 946-2692.
- 55 Buick, 2-dr, radio, excellent work or second car, one owner, \$150, C. Stoker, 534-5367.
- 67 Valiant, 2-dr, very good cond, new tires, plugs, shocks, points & muffler, D. Ward, 488-0715.

- 69 Mercury Montego, 10,000 mi, power, air, like brand new, D. Briggs, 946-5849.
- 68 Impala Sports Sedan, 13,000 mi, air, power, AM/FM, \$2450, P. Weite, 591-3071.
- 66 Charger, low mileage, air, power, new Michelin tires, buckets, very clean, K. Thoma, 471-2976.
- 62 Mercury Custom, 2-dr HT, V-8, automatic, power steering, air, radio, \$650, G. Holloway, 941-0262.
- 66 Chevelle, 4-dr sedan, white, V-8, automatic, low mileage, \$875, 2223 Darrington, 666-2755.
- 64 VW sunroof sedan, low mileage, 591-2710 or 483-5121.
- 67 Olds Cutlass Supreme, air, automatic, power steering, new tires, perfect cond, C. Hohmann, 488-1728 after 5.
- 67 Dodge GT, 6-cyl, factory air, new tires, \$1495, J. Crain, 946-4458.
- 66 Pontiac GTO, blue, 4-speed, 3-barrel, perfect cond, \$1395, 864-4110.
- 63 Galaxie, 4-dr sedan, power steering, air, automatic, radio, \$245, P. Morton, 946-4752.
- 60 Falcon, good running cond, new tires, radio, heater, \$175, R. Edmiston, 643-4030.
- 65 Pontiac Catalina HT, burgundy, standard, air, radio, vinyl interior, Colonna 474-2447.

BOATS

- 69 19' Thunderbird Comanche deluxe, less than 20 hr on 160 hp M. Crusier, R. Burt, 591-2117.
- 13' plywood boat, 10 hp motor, trailer, \$250, J. Westover, 944-2497.
- 21' Thunderbird Formula, 155 hp, OMC 1/O, cabin, marine head, excellent cond, used less than 50 hours, \$4850, S. Roosa, 877-2867.
- 16' Snipe, mahogany deck, main & jib sails, big wheel trailer, excellent cond, S. Holzaepfel, 427-1657.
- Lido 14, orange deck, white hull, trailer, all extras, best offer over \$1200, 877-2925 after 6.
- 40' shrimp boat, \$1700, 452-1621.
- 13' 9" Scorpion board sailboat, new, fiberglass; 15' 3" Demon centerboard sailboat, used, fiberglass, SA 116 sq ft, trailer, B. Ward, 591-2182.
- 17' fiberglass, ib-ob, deep vee, trailer, \$1850, 471-4539.
- Inflatable rubber raft, 4-man, 3 seats, aluminum oars, \$32, 488-1028 after 6.

BIKES AND MOTORCYCLES

- 67 Honda 160, like new, extras, \$375, S. Holzaepfel, 427-1657.
- 66 Yamaha YL 100cc/2 cycle, low mileage, C. Hohmann, \$165, 488-1728.
- 24" boy's bicycle w/speedometer & rear basket, good cond, \$15, J. Stonesifer, 482-7643.

- Honda CB 160, adult owner, low mileage, \$250, B. Gatlin, 932-3969.
- Three AMF 20" bicycles, boy's or girl's, \$15 each, H. Kavanaugh, 534-4854.
- Super Hawk 305, crash bars, windshield, luggage rack, 1200 mi, \$595, 488-1028 after 6.
- Honda 50cc, Super Sport, 1969 model, 2600 mi, 487-0442.
- 1960 model Harley-Davidson, windshield, saddle bags, new tires, & exhaust system, \$700, 932-5420 after 4:30.

SPORTS EQUIPMENT

- Smith & Wesson, M36, .38 Chiefs Special revolver, never fired, w/ammo & holster, \$55, J. Samouce, 488-0406.
- 16' travel trailer, 1969 model, sleeps 6, full galley, no shower, like new, \$1375, V. Wegner, 488-1967.
- Will trade steel utility trailer for 30-30 rifle, E. Ashley, 483-2766 or 932-3411.
- 12 gauge Remington automatic, 3-inch mag, 471-4539.
- 2-man hunting/fishing camp trailer, wired for lights, \$150, excellent marlin 32 special deer rifle, R. Reining, 946-6396.
- Various calibres military rifles, some sporterized, some original w/matching serial numbers, L. Kaigler, 877-4731.
- 357 Mag. Lugar w/scope & specially made holster, Lee loader equipment, \$165, 932-5420 after 4:30.

HOME FURNISHING

- Brand new Sears steel bed frame w/wheels & locks, adjustable to Queen size, cost \$13, asking \$8, Grisaffe, 483-2341.
- Patio accessories: indoor-outdoor carpet, 6' X 6', \$10; green sun screen, 6' X 6' \$2.50, black ceramic pet 14" X 14", \$6 all items 4 mos old, 483-2341.
- Refrigerator, very good working cond, \$40, Ruffing, 944-8533.
- Gas stove w/oven & broiler, very good working cond, \$25, 944-8533.
- Double oven, eye-level Frigidaire electric range, avocado, used less than 2 mo, V. Troxlar, 488-5059.
- 5-piece mahogany dinette set, 1201 Zephyr, Pasadena, 473-9548.
- Round white formica dining table w/2 leaves, 6 white vinyl covered chairs, \$50, Horton, 474-2102.

PETS

- AKC German Shepherd puppies, see after 5 at 3632 Federal Street, Pasadena.
- German Shepard female, 8-mo old, \$100, AKC, B. Adams, 477-2910.
- Miniature Schnauzer female, beautiful salt & pepper, ears trimmed, excellent lineage, AKC, 20 wks, J. Kaltenbach, 464-2426.

- Rare registered Manx kittens, the tailless cats, personality plus, 925-3312.
- German shorthaired pointer puppies, AKC Champion sire, excellent hunting and/or show prospects, 4 mos, shots & wormed, R. Reining, 946-6396.
- Border Collies, black & tan, 6-wks old, 4 females (\$20) male (\$25) 694-1269.
- AKC German Shepherd puppies, excellent pedigree, black & silver, Rin-Tin-Tin bloodline, 485-2625.

MISCELLANEOUS

- Technicolor Movie Club membership, equipment: Super-8 camera, projector, lights, screen, film, processing, \$550 new, sacrifice \$400, 645-1001.
- VOX Super-Beetle Piggyback amplifier, model V1141, replacement cost \$1523, good cond, \$695, J. Weber, 944-3256.
- AM/FM stereo, walnut cabinet, automatic changer w/fine tuning & reverb, audio tape plug-in facility, extra speaker, albums, \$150, Horton, 474-2102.
- Adult & children's games: Clue, Rook, Hi-Q, Carrom 101 game board, Scrabble, Spy Detector, good-excellent cond, Keener, 488-1193.
- AM/FM radio-Stereo console w/records, walnut cabinet, excellent cond, 472-7004 after 6.
- Hammond organ, extravoice w/bench, walnut finish, like new, excellent home entertainment, Vernon, 877-1450.
- Bathenette, play pen, car seat, L. Hayman, 487-0278.
- Radios: 50 Chevy, \$10; 62 Corvair, \$20; transistorized Allstate under dash, \$10, 477-4448.
- Electric motors, F. H. P. \$10 each, 477-4448.
- Fly retractable w/Aero Club Inc. for MSC & contractors, P & K Bonanzas, IFR, 195 mph, \$17/hr wet, Cessna 172 \$9/hr; 150 \$8/hr; Instructor \$5/hr, B. Ward, 877-3187.
- Will fly persons on weekends for cost, F. Blankenship, 944-7050 after 5.
- Mooney M20A, 1550 TT, 600 SMOH Genave Navcom, good paint & interior, \$5950, D. Friis, 944-5000.
- Mall chain saw, fair cond, engine runs good, 36" blade, \$25, A. Smith, 488-3238.
- Custom Kraft electric guitar w/case, Alama amplifier, excellent cond, \$75, 482-7642 any time.
- Relax-a-lounge health cycloid massager, \$60, electric coffee maker, \$5; Rota-Brail "400", \$22, 591-2329.
- B flat Clarinet w/case, good cond, \$50, Garza, 472-5243.
- Conn Cornet w/hardshell-lined case used 3 years, \$100, J. Harris, 591-2129.
- 1959 Skipper Caravan mobile home, air, carpeted, 29' X 8', 483-5112.

- 12-watt Lafayette mono-amplifier, excellent cond, will accept mag phono \$15, 488-3966.
- Cameras: DeJur "Electra" 3 lens, automatic exposure, 8mm, case, \$25; Canon "Demi" half-frame 35mm w/case, like new \$25, Ream, 877-4308.
- Apollo 11 cacheted covers w/view of LM & astronauts for those who enjoy preparing their own stamped envelope covers, 2 for 25c H. Kline, 433-5190.
- Alexander saxophone, completely overhauled, professional mouth piece, looks like new, \$150, case included, S. Roberts, 946-4082.
- Crown Graphic 4 X 5 20 cut film holders, carrying case, like new, K. Haverly, 944-0522.
- Set of 2 rugged Claricon transceivers w/built-in earphone jacks, new antenna, AC adapter, \$20, Keener, 488-1193.
- Collection of Hardy Boys, Tom Swift, Tom Corbett books, superb cond, 30 in all, 75c each or 10 for \$6, 488-1193.
- Carvelle transmitter-receiver transmits to any AM radio over short distance, \$8.50, 488-1193.
- Custom, made-to-order doll clothes, (including Barbie) & stuffed animals, L. Williams, 643-9128 after 6.

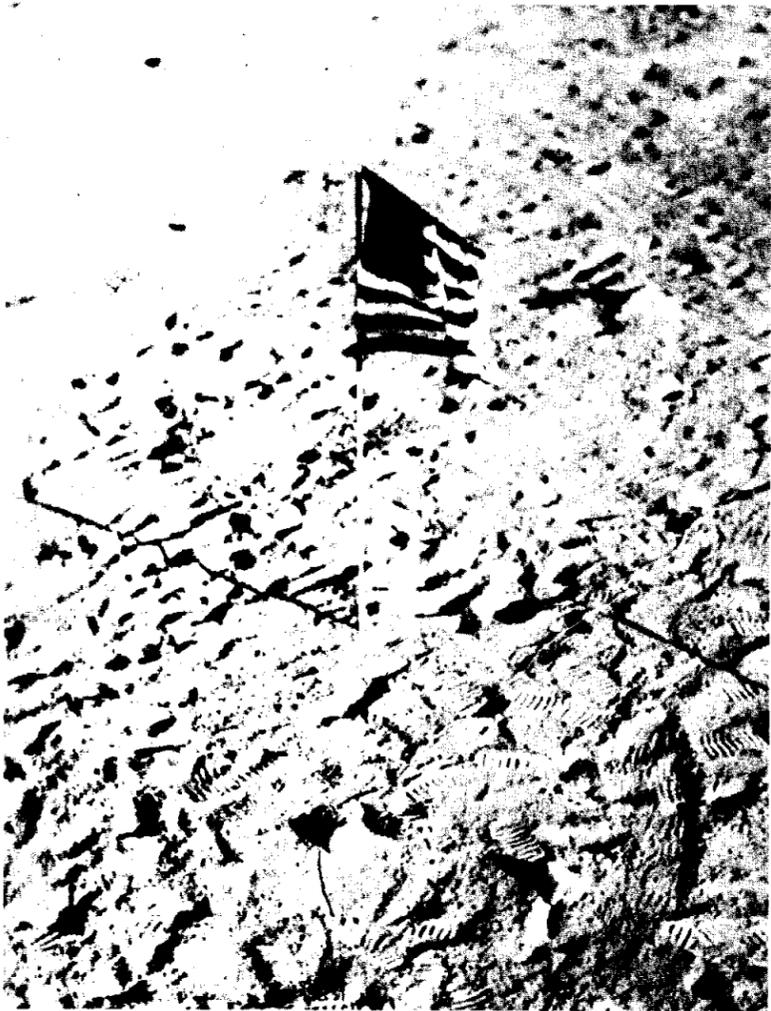
WANTED

- Female roommate to share Bay House apt, 2-1/2-2 C Critzos, 591-2271 after 6.
- Throw-away "junk" TV, Hi-Fi components, etc, will pick up, J. Samouce, 488-0406.
- Ride or share a ride from Bacliff (corner 146 & 517), 7:30 to 4 shift, R Underhill, 966-2337.
- Piano instruction in Nassau Bay by qualified teacher for 2 children, 591-2395.
- Heavy duty wheelbarrow, filing cabinet, manual typewriter, 15" to 18" carriage, M. Messenger, 471-1079.
- Ride (rain or shine) from Bacliff, 8:30 to 5:00 shift, N. Underhill, 966-2337.
- Driver to join existing car pool from SW Houston, 8:30 to 5 shift, S. Jacobs, 774-9924.
- Low equity 4-2-2 Olde English or Colonial home from owner, prefer Clear Lake City but will consider other areas, 932-5241 after 5:30.
- Ride from Pasadena (Tater & Willow) to bldg 416, 7:30 to 4 shift, M. Newton, 473-3475.

LOST & FOUND

- Lost, Black Cocker, vaccination Tag (Dr. Lassig #6685, 1969, "Cinders", vicinity Bowline & Neptune in Clear Lake City, R. Lewis, 488-2801.
- Found, Man's beige raincoat, label "Fly-mouth of Boston" left in office of CSM manager, bldg 2, room 755, X3558.

For those who would ask--'what price glory?'



Apollo 11 color prints available through GPO

Full-color pictures of Apollo 11, including the lunar surface activity, are available now through the Government Printing Office.

The pictures are being offered in either a set of twelve 11" x 14" full-color lithographs, selling for \$1.75 a set, or a single full-color lithograph, 16" x 20" overall, showing man's first steps on the Moon, for \$1.

All prints are suitable for framing.

Three other groupings are also available:

- "Apollo — In the Beginning" — seven 11" x 14" pictures covering various scenes from Apollo missions, including the Earth-rise from Apollo 8. The set sells for \$1.25 postpaid.

- "Men of Apollo" — five 11" x 14" lithographs of the crews of Apollo 7, 8, 9, 10 and 11. This set sells for \$1 postpaid.

Get \$1 off tickets to Ice Capades

The Employee Activities Association is offering special tickets to the Ice Capades, showing now through September 11, at \$1 off the regular price.

The tickets are available on a first come, first served basis from all EAA representatives. Martha Caballero, X2421, is overall coordinator for the sale.

NASA employees are often called upon to justify United States expenditures on space exploration. The following article touches on many of the impressive "spinoffs from space."

by Keith Elliott

"Can this wonderful journey ever lead to any practical result? Reflect a moment on the audacious go-aheadiveness of the Yankee..."

—Jules Verne
From the Earth to the Moon

Back in 1865 Jules Verne, that canny French fictioneer and prophet, foresaw with incredible accuracy Man's most awesome reach, his quest for the Moon.

He even called the shot, targeting his imaginary Moon probe from a site not far from Cape Kennedy. And he prophesied the use of a solid propellant in the mission, too. Gunpowder.

Well, even Jules Verne couldn't call them all. And he begged completely the question of whether "any practical result" might derive from Man's boldest venture. Yet practical benefits already achieved from America's space efforts are as dramatic in many ways as the Moon landing itself.

For instance, space research is playing an increasingly significant role in the field of medicine.

Dr. Denton Cooley, famed Houston heart surgeon, uses a device developed by NASA to monitor heart-transplant patients after surgery. Perfected at the University of Minnesota School of Medicine under a NASA contract, the device can gauge externally the volume of blood being pumped by a human heart.

Small biosensors used to monitor the physical condition of astronauts during flight are now being manufactured by Corbin-Farnsworth of Palo Alto, California, for use in hospitals throughout the nation. Pasted on chests of heart patients, the biosensors broadcast heart data to a nurse at a central console, permitting her to monitor the condition of many patients at once.

A computer technique used by the Jet Propulsion Laboratory to improve TV pictures of the Moon and Mars is now being used to clarify medical X-ray photographs.

And a sensitive meter developed by NASA engineers to detect the impact of micrometeorites on spacecraft has spun off two earthly advances. One is a device that can measure the heartbeat of a chick embryo; the Federal Drug Administration is using it to test the effect of certain drugs. The other is a new medical tool that measures infinitesimal muscle tremors; it is helping physicians in diagnosing neurological ailments,

such as Parkinson's disease, and during delicate neurosurgery.

Clearly, mankind is beginning to reap terrestrial rewards from his \$44 billion investment in space.

And "the process is just now accelerating," according to Dr. Richard L. Leshner. As chief of Technology Utilization — the NASA arm which seeks to apply space techniques and knowledge to the general welfare — Leshner insists "it is still too early to expect many specific transfers of space technology to other sectors of the economy."

He adds: "Since the economists tell us that the total innovative process requires somewhere between 10 and 20 years, it follows that the bulk of the commercially useful returns from the first decade of investment in space research and development will be dramatically harvested in the 1970's."

The best is yet to come, then. Nevertheless, Dr. Leshner's office can cite hundreds of spin-offs from space that have occurred already. Among them:

- An electromagnetic hammer which makes metal flow like soft plastic, allowing the smoothing and shaping of metals without weakening them. Invented by builders of giant rockets at the Marshall Space Flight Center in Alabama, the new tool is widely used now in shipbuilding and auto manufacture.

- A badge-sized hydrogen gas leak detector, developed for rocket engine testing by North American Aviation, is now being marketed as a battery gas leak detector for, among others, small boat owners.

- In South Carolina, high-speed textile looms are being monitored electronically with equipment installed by Space

Craft, a contractor on the Moon vehicle team that is now using space-learned savvy to diversify on Earth.

- An unusually tough coating developed for spacecraft is the basis for a new long-wearing paint now on sale in the nation's retail stores.

- A six-legged vehicle proposed by a NASA contractor for unmanned exploration of the Moon has been redesigned as "the wheel-less wheel chair" for crippled children. The powered walking chair, simple to operate, is being used in a number of children's hospitals. It can cross rough terrain, climb and descend stairs, and has been described by at least one satisfied user as "groovy."

- Pyrolytic graphite, an insulating material for nuclear-powered rockets, is now being used to line the bowls of pipes for a cool smoke down to the last puff. What's more, graphite-lined pipes can be washed with soap and water.

- At least 25 state highway departments are using NASA data in programs to cut down, through new surfacing techniques, wet-weather accidents due to "hydroplaning." NASA's findings have been employed in the surfacing of runways at 15 big-city airports, too, following its depth research into the causes of aircraft landing accidents on rainy days.

- A sight switch developed for astronauts has been adapted to powered wheel chairs, enabling paralyzed people to control their movements by simple sidewise eye movements. In other applications the same switch enables immobilized patients to signal a nurse or to turn appliances on and off.

Courtesy of Humble Oilways.
To be continued. . . .

Co-ops --

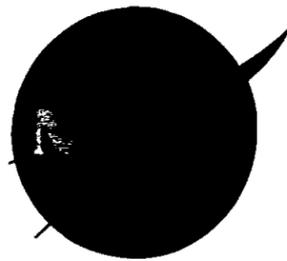
(Continued from Page 3)

Laboratory Engineering Section of Space Environment Testing.

In his current assignment Bartels has completed a design analysis of the solar shield to be used in conjunction with the Apollo Telescope Mount thermal-vacuum tests and he is nearing completion on the design of a scanning device to be used during the calibration of an Infrared Simulator.

"He has been given assignments that are normally assigned to a graduate engineer" said James C. McLane, division chief, "and has, without exception, completed the assignments in an exemplary manner."

news from around



MARSHALL — Marshall Space Flight Center has awarded a \$1,170,000 contract to the Martin Marietta Corporation, Orlando, Florida, for certain flight hardware to be used in the Apollo Applications Program.

The assignment calls for delivery of Saturn V and Apollo Telescope Mount equipment in about 18 months.

LEWIS — The monitoring of changes in radiation experiments has always required the dismantling of the test capsule — a costly process which often destroys the test conditions — since X-ray film is useless around radiation.

Now, scientists at Lewis Research Center have developed a "see-through" procedure using Neutron Radiography which takes pictures of an experiment before, during and after exposure to radiation, without ever opening the protective capsule.

LM-CSM CONTRACTORS — The Apollo 12 flight crew has asked that employees of North American Rockwell, builder of the Apollo command module, and Grumman, builder of the lunar module, select the code names for November's Moon flight vehicles.