

Apollo 15 Loaded With Science Tasks

The 12-day Apollo 15 mission, scheduled for launch on July 26 to carry out the fourth United States manned exploration of the Moon, will:

- Double the time and extend tenfold the range of lunar surface exploration as compared with earlier missions;
- Deploy the third in a network of automatic scientific stations;
- Conduct a new group of experiments in lunar orbit; and
- Return to Earth a variety of lunar rock and soil samples.

Scientists expect the results will greatly increase man's knowledge both of the Moon's history and composition and of the evolution and dynamic interaction of the Sun-Earth system.

The dry, airless, lifeless Moon still bears records of solar radiation and the early years of solar system history that have been erased from Earth. Observations of current lunar events also may increase understanding of similar processes on Earth, such as earthquakes.

The Apollo 15 lunar module will make its descent over the Apennine peaks, one of the highest mountain ranges on the Moon, to land near the rim of the gorge-like Hadley Rille. From this Hadley-Apennine lunar base, between the mountain range and the rille, commander David R. Scott and lunar module pilot James B. Irwin will explore several kilometers from the lunar module, driving an electric-powered dunebuggy—the lunar roving vehicle, for the first time on the Moon.

Three EVAs

Scott and Irwin will leave the lunar module for three exploration periods to emplace scientific experiments on the lunar surface and to make detailed geologic investigations of formations in the Apennine foothills, along the Hadley Rille rim, and to other geologic structures.

The three previous manned landings were made by Apollo 11 at Tranquility Base, Apollo 12 at Surveyor III crater in the Ocean of Storms and Apollo 14 at Fra Mauro.

The Apollo 15 mission should greatly increase the scientific return when compared to earlier exploration missions. Extensive geological sampling and survey of the Hadley-Apennine region of the Moon will be enhanced by use of the lunar roving vehicle and by the improved life support systems of the lunar module and astronaut space suit. The load-carrying capacity of the lunar module has been increased to permit landing a greater payload on the lunar surface.

Additionally, significant scientific data on the Earth-Sun-Moon system and on the Moon itself

will be gathered by a series of lunar orbital experiments carried aboard the Apollo command/service modules. Most of the orbital science tasks will be accomplished by command module pilot Alfred M. Worden, while his comrades are on the lunar surface.

Worden is a USAF major, Scott a USAF colonel and Irwin a USAF lieutenant colonel.

During their first period of extravehicular activity (EVA) on the lunar surface, Scott and Irwin will drive the lunar roving vehicle to explore the Apennine front. After returning to the LM, they will set up the Apollo Lunar Surface Experiment Package (ALSEP) about 300 feet West of the LM.

Experiments in the Apollo 15 ALSEP are: passive seismic experiment for continuous measurement of moonquakes and meteorite impacts; lunar surface magnetometer for measuring the magnetic field at the lunar surface; solar wind spectrometer for measuring the energy and flux of solar protons and electrons reaching the Moon; suprathreshold ion detector for measuring density of solar wind high and low-energy ions; cold cathode ion gauge for measuring variations in the thin lunar atmosphere; and the heat flow experiment to measure heat emanating from beneath the lunar surface.

Scott and Irwin will use for the first time a percussive drill for drilling holes in the Moon's crust

(Continued on Page 2)

ROUNDUP

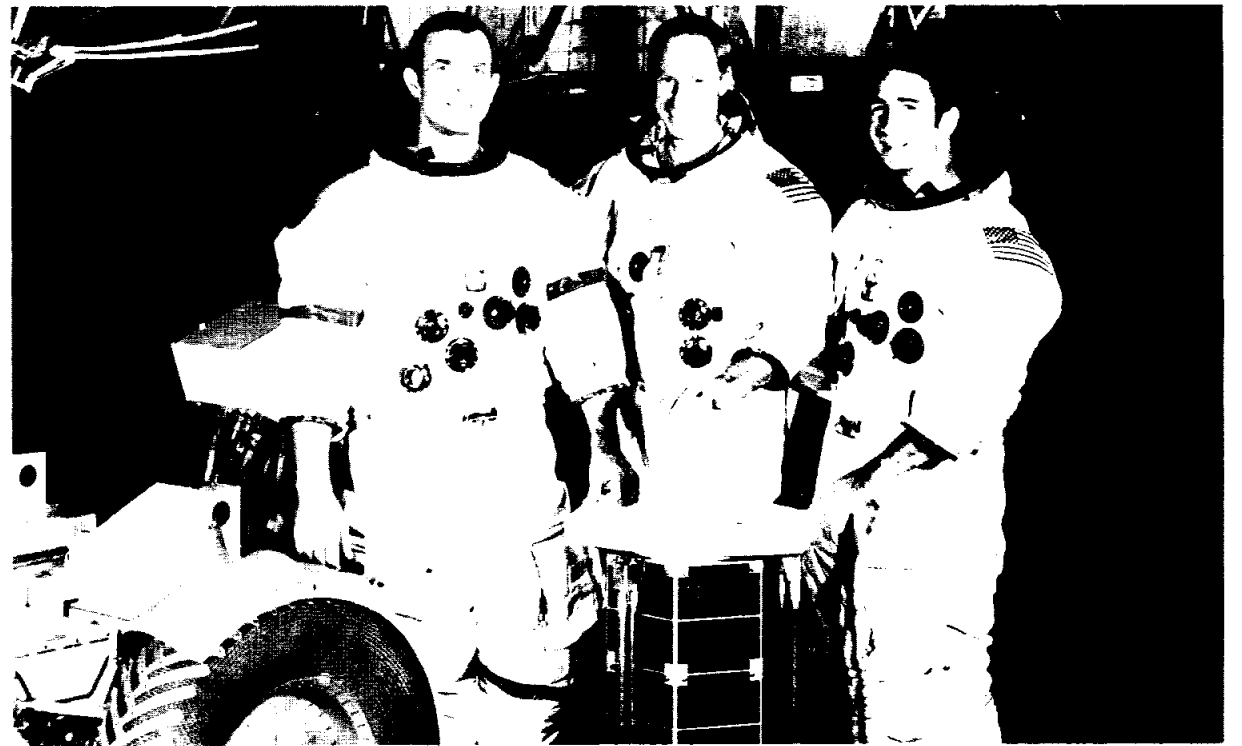
NASA MANNED SPACECRAFT CENTER

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T MINUS 10 DAYS AND COUNTING—Apollo 15 prime crewmen David Scott, Alfred Worden and James Irwin seem eager to be on their way to the lumpy Hadley-Apennine landing site between a tall mountain range and a deep gorge. Scott and Irwin will tool around the surface in the Lunar Roving Vehicle—a sort of electric dunebuggy similar to the training model in the photo. Meanwhile, back in lunar orbit, Worden will be too busy with scientific tasks to be lonely. Among the orbital science experiments is the subsatellite (model in foreground) carrying three experiments which will be ejected into lunar orbit for hopefully a year of space physics data gathering. The all-Air Force crew has named the command/service module "Endeavour" after 18th-century British explorer Capt. James Cook's vessel, and the lunar module "Falcon" for the USAF Academy mascot.

MSC Awards Three Contracts For Shuttle Surface Materials

Three contracts valued at nearly \$1 million for development of new surface materials for the Orbiter stage of the Space Shuttle have been awarded to the aerospace industry by MSC.

The companies are: McDonnell-Douglas Corporation, St.

Louis, Missouri, \$325,000; General Electric Company, Aerospace Group, Philadelphia, Pennsylvania, \$319,200, and the Lockheed Aircraft Corporation, Missiles and Space Company, Sunnyvale, California, \$322,500. The different dollar amounts are in-

fluenced by the slightly different development tasks allotted to each firm.

NASA is requesting the companies to design, develop and test a ceramic insulator class of materials. This type of material appears to best meet the requirements of lightweight, reusability and low costs—all desired traits for the Shuttle.

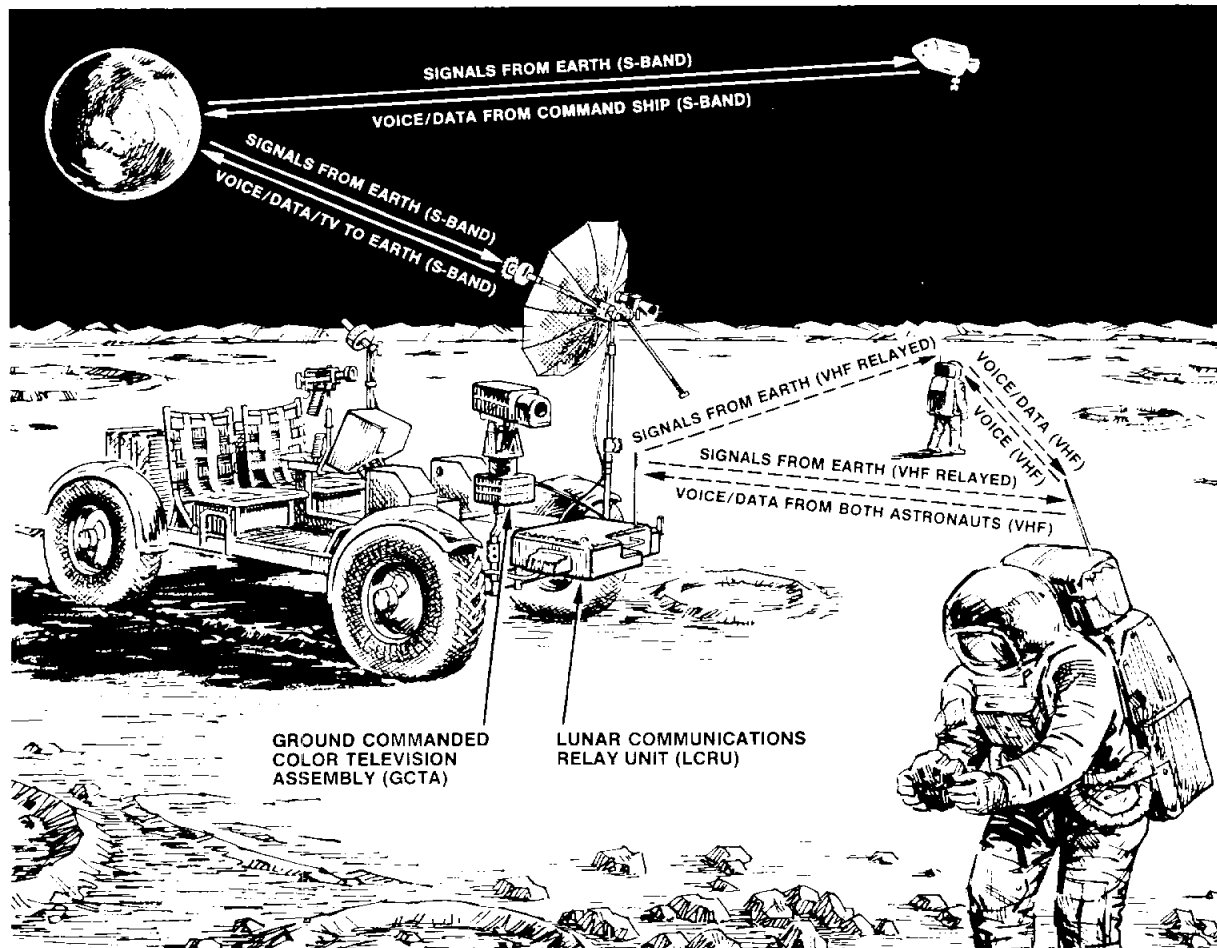
The companies have been requested to deliver sample tiles sized to 12 x 12 inches x 2 inches thick to MSC for specialized testing. The agency plans to expose these panels to hard vacuum, infrared transmissions, radiation, micrometeoroid bombardment, freeze/thaw cycles, dusts, rain and chemical contaminants.

LSU Magazine Features Faget

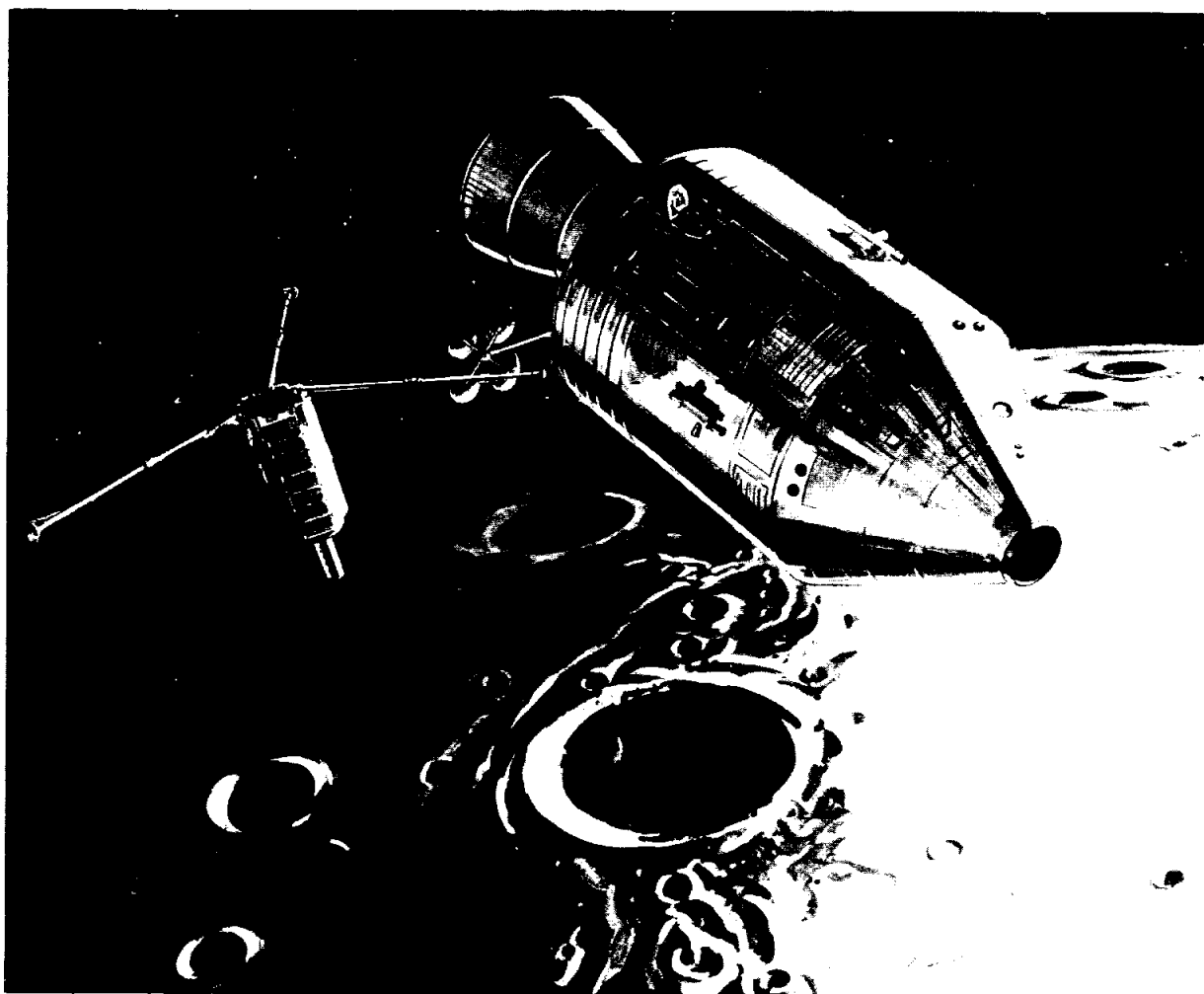
MSC Director of Engineering and Development Director Maxime Faget is featured in the June issue of the Louisiana State University *Alumni News*.

The article, "Max Faget, Grandshire of Apollo," was written by Jack Fiser, LSU alumni publications editor. Faget was named LSU 1971 Alumnus of the Year.

The article traces Faget's career with NASA and NACA over the past 25 years—from a research scientist at Langley Research Center to his present position.



FAR-RANGING EXPLORERS Dave Scott and Jim Irwin will extend the amount of lunar surface that can be explored by riding in an electric dunebuggy called the Lunar Roving Vehicle. They will be able to go "over the hill" from the lunar module and still stay in radio and television contact with Mission Control Center through the Lunar Communications Relay Unit mounted on the front of the Rover. The Ground-controlled Television Assembly will be aimed and focussed by the Instrumentation and Communications Officer in Mission Control to track Scott and Irwin during their 20 hours on the lunar surface in three EVAs. In addition to emplacing long-term scientific experiments near the lunar module, the pair will make long exploration traverses to the foothills of the Apennine mountains—highest on the Moon—and to the edge of Hadley Rille, gathering geologic data and samples en route.



MINI-SATELLITE—Artist's rendering shows the Apollo 15 scientific subsatellite shortly after it is ejected into lunar orbit for gathering lunar vicinity space physics data over a period up to a year. The subsatellite will be housed in a compartment in the service module Scientific Instrument Module (SIM Bay) and kicked into orbit just before Apollo 15 transearth injection.

Subsatellite to Relay Lunar Data For Year Beyond Mission End

While circling the Moon, the Apollo 15 spacecraft will launch an 80-pound subsatellite that will remain in lunar orbit and radio scientific data to Earth for a year after Apollo returns.

The hexagonal-shaped device, 31 inches long and 14 inches in diameter, carries three of eight new experiments housed in a bay of the Apollo Service Module previously occupied only by an oxygen tank.

The scientific instrument module (SIM) bay, as it's called, is shielded during Apollo's three-day journey from Earth by a door that will be blown off by small explosive charges about 4½ hours before the spacecraft begins circling the Moon.

The subsatellite, housed in a box-like container similar to a rural mailbox, will be pushed out by a spring mechanism shortly before the spacecraft leaves lunar orbit for return to Earth.

When clear of the spacecraft, the subsatellite will put out three evenly spaced five-foot booms. On one of these is a magnetometer that will measure interplanetary and Earth magnetic fields near the Moon. The other two booms bal-

ance it to stabilize the little satellite as it spins at about 12 revolutions per minute. The orbit will range from 55 to 75 nautical miles above the Moon.

The subsatellite, powered by solar cells and a rechargeable battery, also carries charged-particle sensors and equipment to detect variations in lunar gravity caused by mass concentrations of dense material within the Moon.

Other instruments in the SIM bay are:

- A gamma-ray spectrometer—on the end of a 25-foot boom—to determine the concentration of radioactive elements in the lunar surface;

- An X-ray spectrometer, to determine the concentration of major rock-forming elements in the surface;

- An alpha-particle spectrometer, to locate radon sources in the surface;

- A mass spectrometer, on the end of a 20-foot boom, to obtain data on constituents of the lunar atmosphere; and

- A laser altimeter to measure precisely the spacecraft's altitude above the lunar surface.

Two other command/service

module experiments will use the spacecraft's communications systems to detect variations in lunar gravity caused by mass concentrations and to obtain data on lunar electrical properties, surface roughness and depth of the surface layer of rubble.

Also carried in the SIM bay are a large 24-inch panoramic camera to take high-resolution photographs of the lunar surface, both stereo and monoscopic, and a three-inch mapping-stellar camera to obtain simultaneously exposed high-quality photos of the lunar surface and star fields to determine the precise location of the spacecraft.

To retrieve the exposed film, Astronaut Alfred M. Worden will climb out of the command module hatch and maneuver hand-over-hand along the service module during the homeward journey. His "space walk" will be televised live and in color for viewers around the world.

Book Features Dee O'Hara

Dolores B. "Dee" O'Hara of the Preventive Medicine Division is one of five nurses featured in a new book for subteens titled *Great American Nurses*. The author is David R. Collins.

The book recounts her decision to enter the nursing profession, her education and training, her entry into the Air Force Nurse Corps, and finally her assignment in 1959 as nurse to the first group of American astronauts, an assignment which she still holds today.

Apollo 15 Objectives

(Continued from page 1)

for placement of the heat low experiment sensors and for obtaining samples of the lunar crust.

Bigger Mirror

Additionally, two experiments independent of the ALSEP will be set up near the LM. They are the solar wind composition experiment for determining the isotopic makeup of noble gases in the solar wind; and the laser ranging retro-reflector experiment which acts as a passive target for Earth-based lasers in measuring Earth-Moon distances over a long-term period. The solar wind composition experiment has been flown on all previous missions, and the laser reflector experiment was flown on Apollos 11 and 14. The Apollo 15 reflector has three times more reflective area than the two previous reflectors.

The second EVA will be spent in a lengthy geology traverse in which Scott and Irwin will collect documented samples and make geology investigations and photo-panoramas at a series of stops along the Apennine front.

The third EVA will be a geological expedition along the Hadley Rille and northward from the LM.

At each stop in the traverse, the crew will re-aim a high-gain antenna on the lunar roving vehicle to permit a television picture of their activities to be beamed to Earth.

"Gotcha"

A suitcase-size device — called the lunar communications relay unit — for the first time will allow the crew to explore beyond the lunar horizon from the LM and still remain in contact with Earth. The communications unit relays two-way voice, biomedical telemetry and television signals from the lunar surface to Earth. Additionally, the unit permits Earth control of the television camera during the lunar exploration through the Ground Controlled Television Assembly (GCTA)—nicknamed "Gotcha!"

Experiments in the Scientific

Instrument Module (SIM) bay of the service module are: gamma-ray spectrometer and X-ray fluorescence which measure lunar surface chemical composition along the orbital ground track; alpha-particle spectrometer which measures alpha-particles from radioactive decay of radon gas isotopes emitted from the lunar surface; mass spectrometer which measures the composition and distribution of the lunar atmosphere; and a subsatellite carrying three experiments which is ejected into lunar orbit for relaying scientific information to Earth on the Earth's magnetosphere and its interaction with the Moon, the solar wind and the lunar gravity field.

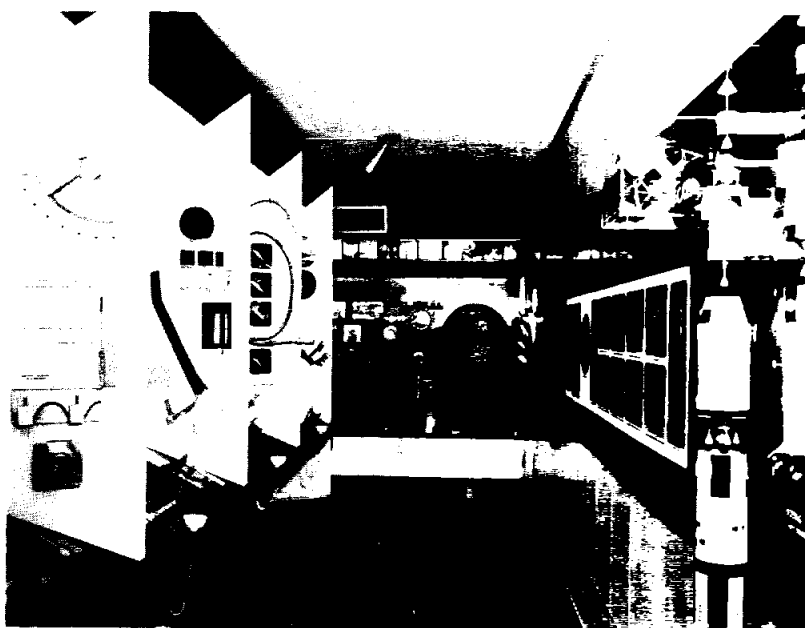
The SIM bay also contains equipment for orbital photography including a 24-inch panoramic camera, three-inch mapping camera and a laser altimeter for accurately measuring spacecraft altitude for correlation with the mapping photos.

Worden will perform an in-flight EVA to retrieve the exposed film. Selected flight experiments will be conducted during transearth coast.

Scheduled for launch at 8:34 am CDT, July 26, from NASA's Kennedy Space Center, Fla., the Apollo 15 will land on the Moon on Friday July 30. The lunar module will remain on the surface about 67 hours. Splashdown will be at 26.1° North Latitude by 158° West longitude in the North Central Pacific, north of Hawaii.

Apollo 15 command module call sign is "Endeavour," and the lunar module is "Falcon." As in all earlier lunar landing missions, the crew will plant an American Flag on the lunar surface near the landing point. A plaque with the date of the Apollo 15 landing and signatures of the crew is affixed to the LM front landing gear.

Apollo 15 backup crewmen are USN Capt. Richard F. Gordon, Jr., commander; Mr. Vance Brand, command module pilot; and Dr. Harrison H. Schmitt, lunar module pilot.



MOBILE EXHIBIT — The MSFC Manned Flight Awareness traveling exhibit "Craftsman Ship" will visit MSC August 3-5 and will be located near the Auditorium. The Craftsman Ship has displays of examples of the type of precise workmanship needed in metallurgy power generation, propulsion and other types of space technology. The exhibit stops at NASA field centers and contractor plants to promote quality workmanship on manned flight hardware.

ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS



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Editorial Staff: Sydni Shollenberger, A. "Pat" Patnesky



KEGLER CHAMPS—The Pin Pounders walked away with all the trophy hardware in the MSC 1970-1 bowling season. Wearing victorious grins are, left to right, Nick Jevan, Jack Kochner, Bailey Chaney, John Lottinville, Arc Lee and Dick Wieland.

Soviet Lunar Samples Given to U.S. Scientists

Twenty-four U. S. scientists July 9 began receiving samples of soil returned from the moon by the Soviet Union's Luna 16 spacecraft.

Three grams of the Soviet sample, returned from the moon's Sea of Fertility by the unmanned Luna on September 24, were provided the U. S. in exchange for three grams each of Apollo 11 and 12 lunar sample.

The exchange was based on an agreement reached January 21, 1971 between the U. S. and the Soviet Union.

Dr. Larry A. Haskin, Vice Chairman of the Lunar Sample Analysis Planning Team said, "Acquisition of part of the Luna 16 material obtained by the Russians makes possible important measurements on an area of the moon that will not be sampled in the Apollo program."

Dr. Haskin, Professor of Chemistry at the University of Wisconsin, Madison, and Dr. Paul Gast, Chief of the Planetary and Earth Sciences Division at MSC, were members of a group headed by Lee R. Scherer, Director, Apollo Lunar Exploration Office, NASA Headquarters, Washington, which delivered the U. S. sample and

picked up the Soviet sample in Moscow June 10.

Dr. Gast said conversations with Soviet scientists and reports published by the Russians imply that the loose material or regolith covering the Sea of Fertility where Luna 16 landed contains significant differences from such material sampled on three U.S. Apollo missions.

Dr. Gast said Soviet scientists feel the Sea of Fertility regolith is much thinner and therefore closer to underlying strata than the soil of other lunar mare areas.

He also noted that the Soviet sample, which was collected in a hollow core tube similar to core tubes which have been used in Apollo, contained a much wider gradation of individual grain sizes than was seen in core samples returned by U. S. astronauts.

The three grams of sample provided NASA for distribution to U. S. scientists includes 1.5 grams from near the top of the 35 centimeter core tube and 1.5 grams from near the bottom of the tube. The sample is mostly fines and coarse fines with several small pebble size fragments interspersed. The largest of the pebbles in the U. S. sample weighs 62 milligrams and is described by the Russians as a coarse grained basaltic rock fragment.

Only about 600 milligrams of fine materials (about 20% of the in the initial allocation of the Soviet sample. In describing the sample distribution plan, Dr. Haskin said, "Although we feel that one-half or more of the available Luna 16 material can reasonably be distributed to principal investigators over the next few months, we believe that it is best to do this in at least two stages."

Logisticians Pick New Officer Slate

The Houston Chapter of the Society of Logistics Engineers has recently elected a new slate of officers for the coming year. They are: William A. Parker, MSC, Chairman; Delmar Howard, Philco-Ford, Vice Chairman; Earl Regan, General Electric, Secretary-Treasurer.

In addition to the elected officers, several appointments have been made by the Chapter. They include: Jack Crane, STC, Membership Chairman; Frank Hickey, total sample) will be distributed MSC, Education Committee; Billy Bennett, Publicity Chairman and Editor; Dan Herrera, Philco-Ford, Program Chairman; Paul Sturtevant, MSC, Assistant Program Chairman/Special Events.

Person interested in affiliation with this group are urged to contact Mr. Jack Crane, STC, at 483-6313.

Supply Shopping to be Streamlined

What? Supplies with no paperwork?

That's correct! In a service test being conducted with the Photographic Technology Division, the Logistics Division has begun a direct telephone supply requisitioning system that does away with the usual supply requisition (DD Form 1348). In fact, the system is so simple that the requisitioner need not even call out a multidigit stock number. All he has to do is refer to a preprinted form and call off the item number—just like ordering breakfast at a short order house.

The innovation, not uncommon in industry, is designed to improve customer support and reduce significantly. According to Bill Parker, chief of the Logistics Division, the photo division was selected for the trial because it represents

an area with heavy common supply activity and is one of the more critical operational elements supported at MSC. Parker says that if the system works as expected, additional functional areas will be afforded telephone requisitioning service. Here's hoping!

In addition to the telephone supply requisitioning system, the

Logistics Division is also studying two other concepts designed to streamline the supply system. Being considered are mobile vans that would make scheduled stops at various isolated buildings on-site and a retail store where MSC employees would actually shop for the items they need, much like in a modern supermarket.

Roundup Swap-Shop

Deadline for Swap-Shop classified ads is Thursday of the week preceding Roundup publication date. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 20 words, including name, office code and home telephone number. Send ads, typed or legibly written, to Roundup Editor, AP3)

MISCELLANEOUS

Large upholstered Contemporary Custom Chair, 2 Marble Octagonal Cocktail/Occasional Tables; Wrought Iron Base. Xln. Cndn. Kline, 523-3185.

9x9 Umbrella tent, \$30 Luggage rack for Yamaha 350 cc R5, \$10, 1 year old, Sears 3/8 inch drill, \$15, Hutchins 877-4604, Kemah. Baby's crib/mattress, stroller, high chair, lampswitch cover, \$20 for all. D. C. Brown, 944-4631.

Gasoline Edger-Trimmer—less than one year old. \$45. Headboard, gold tufted for king size bed. \$75. Corrales, 877-2291.

Baby crib and mattress. Your choice of finish, white \$25, dark \$35. Worley, 488-3294.

Four drum Gold sparkle Ludwig drum set with 12" cymbal. Good condition. \$250.00. Wasson, 488-2722, after 6 p.m.

Ladies golf clubs with bag. Used little. \$25.00. Smith, 331-3737.

1/4-carat diamond pendant, yellow gold, \$100. Phone 471-4071 after 5 p.m.

W. F. Ludwig, snare, bass, bass tom-tom, floor tom-tom, 3 cymbals, stool. \$250.00 for drum set. Deatkine, 488-3866.

23" color TV with RCA Matrix Tube. New custom built heathkit, worth over \$600, works perfect \$300. Tex Ward, 481-2266.

Standard size flat top Guitar \$15. Huss, 482-7896.

Singers best. Straight stitch Portable sewing machine. Xln cndn. Gravett 932-5241.

"Cat Slingshot" X03 Trail Bike, in xln condition, less than 500 miles \$120.00. Gaudiano, WA3-1722.

RCA 25" Color TV w/swivel base cabinet, 1 year old picture tub \$200.00. Nerina, 481-0608.

Motorcycle trailer \$100. Wilson, 488-2540.

Sony model 650, Three-motor, Three-head Soelnoid-operated stereo, tape-deck, S-O-S, Echo, etc., New. \$472.50—Best offer. Wanhoo, 644-7777.

14' Ouachita aluminum flat-bottom fishing boat with live bait well. Galvanized trailer, Rig used 6 times. New \$272. sell for \$180. Ward, 946-5182.

Clarinet Bb. Selmar soloist Professional callbar instrument. Used 2 years by high school band student. Excellent condition. Original cost \$285-Sale price \$175. Rubenstein, 877-3288.

57 Chevy generator, starter, fuel pump, exhaust system and two like new 775x14 tires. Felder, 483-6381.

Sears auto air conditioner complete with mounts for 6-cyl Chevy, \$50. Stamps, 483-Weston digital volt meter (0 to 1 volt), new, \$200. Meeker, 483-7488.

Stereo components, Bogen turntable, Dyna 60 watt amps (2), preamp, stereo tuner, \$441.

31 "Nancy Drew" books for girls approx. age 12 thru 16, new cost \$45, like new, sale cost, \$15. Muhly, 471-3762.

matching switch panel. Everything works. \$125. Meeker, 483-7488.

5 pc chrome and formica dinette set, good cndn.; small lamp table. Richichi, 488-4487.

Dryer, gas, Whirlpool. Works well xcept needs new valve, \$25. Handley, 482-7041.

Bike, Sears 20-inch boys' model, good cndn, \$15. Handley, 482-7041.

WANTED

Airplane (J3, Aeronica, Taylorcraft, etc. to rebuild, buy or trade for sailboat. Stan Holzapfel, 483-4401.

Oscilloscope, Don Witt, 667-2733.

Someone to share 1 bedroom apartment at \$60/month. Marar, 488-6027.

VEHICLES

67 Triumph TR-4A, Excellent condition, dark green. D. White, 488-1024.

60 Pontiac, 4-dr. sedan; new paint, runs—\$100.00. 932-3489 after 5 p.m.

65 Pontiac GTO, Radio, Air, 4 on Floor, Good condition—\$995.00. Bullock, 488-1042.

60 Mercedes Benz 190Db (Diesel) by original owner. Paul E. Brandenberger, 482-7883.

60 Dodge, Air conditioned, 6 cyl, standard transmission, runs fine, good work car—\$100.00. Peters, 534-3264.

64 Rambler Classic, 4 dr. wagon, factory air, undercoating radio, automatic transmission, excellent condition. \$575.00. Lee, 481-0553.

66 Tempest, 4-dr. 6 cyl, overhead cam, at + ps; recently had valve job—\$575. Welsh, 946-0235.

67 Pontiac GTO, 4-speed, air-conditioned, sun tach, mag wheels, new tires, hooker headers, xln cndn, \$1400. White, 877-3153.

69 Apache travel trailer, 25 foot tandem, sleeps 8, self-contained w/full bath, A/C, stereo. Cost new \$6,000. Make offer. Felder, 483-6381.

62 F85 Olds, 4-dr sedan, good 2nd car, good cndn, see and drive to appreciate. \$275. Richichi, 488-4487.

Honda 50, frame model C110, engine parts, misc parts, all for \$10. Mark, 488-5037.

Go-cart, 2.5 B&S engine, 20 MPH, \$20.

Mark, 488-5037.

65 Fury, 44,000 miles, air conditioned, power steering, radio, xln cndn, \$850. Edwards, 483-3688.

Suzuki 90 (Honcho), yellow, in good cndn, \$250. Bean, 591-3814.

BOATS

15 1/2 Snipe Sailboat, like new, with trailer, \$850.00. Stan Holzapfel, 483-4401.

18' Fiberglass boat, trailer, 100 HP Merc., 12.6—6 gas tanks \$1050, Taylor, 488-3591.

Sailboat, Gulf Coast 21 w/working sails, 5 HP OBM, \$2500. Hill, 932-5269.

12' Dolphin fiberglass sailboat and trailer, xln cndn, four lifevests available, too. Kruppenbacher, 877-2227.

19' fiberglass lighting sailboat w/trailer. Boat in good shape, \$900. Weete, 488-5200 or 877-1022.

REAL ESTATE & RENTALS

Clear Creek Village, League City, Beautiful colonial Home, better than new, very large, many normal and unique extras, priced to sell quickly, \$35,000. Glassburn, 932-4682.

80'x200' beautifully wooded lot. Dickinson, All utilities, \$4500. Planche, 474-2660.

Beach home for weekly rental at Spanish Grant West Galveston. On beach, well-furnished all but linens. Wasson, 488-2722, after 6 p.m.

Seabrook, 3-2-2, large room (1700 sq. ft.) school nearby, A/C, self-cleaning range, drapes, fireplace, landscaped patio w/gas equipment, 6-3/4% VA, low equity. Kuhlenschmidt, 474-2319.

Friendswood: 3-2-2 brick, large fenced lot, 7.1% FHA assumption, \$175.00 month. Total price, \$24,100. C. D. Harris, 482-1872.

PETS

Purebred Collie Pups, no papers, males \$35, Females \$30, Sable & White/2 tricolor, 7 males, 2 females. Ready for sale. August 11, Lottie Jack, 938-8237 after 6 p.m.

Horse, Gelding, \$125. Saddle \$80. Bridle and Reins, \$20. Huss, 482-7896.

Irish setter pups, AKC, FDSB, National Championship field trial and show lineage. Morris, 591-2910 after 6:00 p.m.

Free kittens, 10 week old. Don't miss this opportunity! Lousma, 482-2360.

Adorable reg. tailless Manx kittens, show quality rumpies, \$75 with or \$50 without papers. Young, 925-3312.

Elegant reg. Borzoi puppies, show quality, English bloodlines. Bargain at \$175 before weaning. Young, 925-3312.

YOUR JOB IN FOCUS

Since July 1, retention registers have been available in the Personnel Office for review by all employees. In addition, representatives of the Personnel Office reviewed the retention registers with interested employees at various locations around the Center during the week of July 6 through July 9.

The availability of these registers provides each employee the opportunity to review his retention standing prior to the impending reduction in force, and an opportunity to discuss various RIF procedures with a Personnel Management Specialist.

The retention register will continue to be available for review in the Personnel Office, Room 161, Building 2. Employees are invited to contact the Personnel Office at Ext. 4331, 6211, 2921, and 3271 should they have questions concerning reduction in force.



THEY WONDER WHERE THE WATER WENT—Members of the Jamaican Geological Survey and the MSC Earth Resources Aircraft program scan 9-inch overlapping color photos of Jamaica made during the April mission flown over the Caribbean Island. With an average 200-inch annual rainfall, little of the water reaches the island's reservoirs but drains, it is believed into subterranean passages to flow into the sea. (See story in July 2 **Roundup**.) Left to right are mission manager Leon Ballinger, Vern Johnson of Lockheed Electronics Co., A. D'Aguilar of Jamaica, Geological Survey of Jamaica director John Williams and MSC Earth Observations Division deputy chief Jim Sasser. The mission was flown at the joint request of Jamaica and the United Nations.

Apollo 14 Soil Samples Differ from Prior Digs

Soil returned from the Fra Mauro region of the moon where Apollo 14 landed appears distinctly different from soil collected at mare sites visited by previous Apollo mission, according to studies of the material by scientists at MSC. Apparently at least two types of rock developed early in the moon's history.

Dr. Arch Reid of the Geochemistry Branch of MSC told scientists attending the annual meeting of the Committee on Space Research (COSPAR) in Seattle late last month, that in contrast to the Apollo 11 and 12 rocks, which are called mare basalts, the Fra Mauro material is significantly lower in the ratios of calcium to aluminum and iron to magnesium and is higher in several minor and trace elements such as potassium, barium, and the rare earth elements.

Dr. Reid said chemical and mechanical mixing of mare basalts and Fra Mauro material has occurred in the formation of the loose soil or regolith that covers the lunar surface. Scientists at MSC had earlier discovered a non-mare component in the mare soil. At the Apollo 14 site this non-mare material predominates, and material from the mare areas is a minor component, comprising only about ten percent of the Fra Mauro soil.

Detailed studies of soil returned from Apollo 14 reveal that the Fra Mauro formation contains a series of similar basaltic materials which are quite different from the iron and titanium-rich mare basalts. The Fra Mauro materials are probably all genetically related and may be derived by partial melting and crystallization processes from

a parent rock type at shallow depth.

Dr. Reid said one of the rock samples returned by the Apollo 14 crew, an eleven and a half pound igneous rock designated sample 14310, has essentially the composition predicted for the parent of the Fra Mauro material. The texture of rock 14310, he said, implies that liquids of this composition once existed at the lunar surface.

Coupling the information from the Apollo 14 samples with the earlier studies of mare samples from 11 and 12, Dr. Reid said, we now have sampled two distinct types of lunar material. The mare samples are iron-rich basalts derived about a billion years after the formation of the moon by partial melting of the lunar interior. The Fra Mauro samples provide evidence of development presumably early in lunar history of a complex crust, enriched in trace elements. While quite distinct, said Dr. Reid, both systems have chemical compositions that are unlike any suggested primitive material from which the moon may have originally formed. Thus evidence to date, he said, suggests that the moon is a complex, heterogeneous body with marked differences in composition between the interior and the outer portions.

Medics Give Apollo 15 Crew 'go'

The Apollo 15 crew, now in final training and pre-launch preparations last week received a "medical go" from Dr. Charles A. Berry, Director of Medical Research and Operations following the first in a series of medical examinations.

Dr. Berry said that laboratory tests of the crew's F-minus 30-day physicals confirm that the prime crew and backup crews have no abnormalities and at this time are cleared for launch. The prime crew—mission commander David R. Scott, command module pilot A. M. Worden and lunar module pilot James B. Irwin — received their preliminary physicals on June 29. The backup crew of astronauts Richard F. Gordon, Jr., Vance D. Brand and Harrison A. Schmitt underwent their physicals the previous day.

Dr. Berry said the laboratory tests of the June physicals were completed July 6 at MSC, and the lab workup confirms the health of the crew members.

The crews underwent an additional physical examination on July 12, and will be checked at F-5 days on July 21, and on launch morning.

As a guard against possible exposure of the crews to disease or illness, a program of close medical surveillance was instituted last week at Cape Kennedy and MSC. In addition to medical surveillance, the program similar to that initiated prior to Apollo 14, calls for close control of the numbers of people having contact with the crew.

The Flight Crew Health Stabilization Program provides clinical medicine, and immunology programs, and limitation of the number outside contacts with the

flight crew.

- Crew members (prime and backup) will reside solely in the Crew Quarters while at the Kennedy Space Center for a period of 21 days prior to launch.

- Access to primary training areas utilized by crew members will be controlled by the KSC security forces while occupied by flight crews.

- Access to areas during crew occupancy will be limited to properly badged primary contacts, or by waiver from the Director of Flight Crew Operations and subject to medical clearance from the Director of Medical Research and Operations.

- The major scope of crew activities will be limited to the primary areas of the Manned Space Operations Building (MSOB) and Flight Crew Training Building (FCTB), the flight line, and launch pad white room during the 21 day prelaunch period. Primary areas of the MSOB and FCTB are those areas with special air conditioning. Crew access to other than these areas requires special approval.

- Crew members will use personal vehicles when traveling from one primary area to another. The transfer van will be used when crew members travel from MSOB to the launch pad.

In the event crew members are required to be at MSC for training purposes they will reside in their own residence or the crew reception area of the Lunar Receiving Laboratory. Appropriate security controls will be implemented if crew members choose to stay in their homes while at MSC and children and everyone but the wife who is primary contact will be excluded.

Starting 60 days prior to launch all illnesses occurring in family members of prime, backup, and support crews, as well as close contacts of these families are being reported to medical officials. A group of KSC employees will be similarly followed.

Primary contacts (wives, backup crew members, mission essential personnel) have been given physical examinations as early as 90 days prior to launch.

The follow-on medical surveillance is expected to maximize the possibility that those who come in contact with the crew prior to launch are healthy.



FOCUS ON SALYUT—MSC Astronomical Society member Paul Maley made this time exposure of the Soviet space station Salyut July 4 from atop a hill near Helotes, Texas. Salyut was moving from northwest to southeast over Del Rio, Eagle Pass and Laredo at an altitude of 177 miles. The bright object at lower left is the planet Mars moving through the constellation Libra. Maley used a 35mm Canon with 50mm f1.8 lens, exposing for 20 seconds on Tri-X film.