

JSC Implements Innovative Suggestions Submitted By Employees

Some time ago, Robert L. Martin of the Logistics Division realized that a great deal of research was required to verify the "unit of issue" for items desired from the Center's supply warehouse. The idea occurred to him that the price and unit of issue of these items could be added to the Cross Section of the JSC Store Stock Catalog thus saving the researcher a significant amount of time.

His idea, submitted formerly through the JSC Suggestion Program, was adopted and has been incorporated in the latest edition of the Store Stock Catalog. Martin received \$50 for his efforts.

JSC is always on the lookout for innovative ideas that will improve operations at the Center. Many of the suggestions submitted by employees are implemented and these personnel are given cash awards and certificates of appreciation. Along with Martin, eleven other Center employees recently were awarded for their suggestions.

Joseph P. DeCorte of Quality Assurance suggested that flight and non-flight equipment be shipped separately rather than together in order to permit special processing and handling of flight hardware while releasing less critical hardware for transportation under normal handling procedures. JSC management concurred with the recommendation and JSCM 4000B was revised to reflect the change. DeCorte received a \$75 cash award.

First Skylab Crew Gets Haley Award

The first Skylab flight crew, Charles Conrad, Jr., Joseph Kerwin and Paul Weitz, recently received the Haley Astronautics Award at a conference in Huntsville, Alabama on the Scientific Experiments of Skylab. The conference was sponsored jointly by the American Institute of Aeronautics and Astronautics (AIAA) and the American Geophysical Union (AGU).

The award is given in honor of Andrew G. Haley, a pioneering AIAA official, "for outstanding contributions by test personnel who undergo personal risk in the advancement of space flight."

The three Skylab crewmen were cited for the "courage and skill exhibited in surmounting the problems that occurred during the launch of the Skylab space station."

The citation stated further: "The first astronauts in the history of space flight to accomplish a major in-flight repair task on a space vehicle, they paved the way for launching two additional missions, confirmed man's ability to function for extended periods in space, and completed major scientific experiments that yielded important

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A suggestion by Paul S. Moravek* of the Technical Services Division resulted in savings of \$680 to JSC. He pointed out that each time checkouts were performed on accumulators—mechanisms used to prevent

sudden shock in hydraulic systems—pressure was lost on the hook-up devices, requiring a recharge of the accumulators. He proposed the installation of a monitoring gauge with operating pressure stenciled on the outside

of the accumulators. The idea was adopted by Technical Services and Moravek received a \$70 award.

Dorothy Ludwig of the Management Services Division realized that no method of identifi-

cation was available for reproduction and microfilm equipment that used harmful chemicals, and that there were no instructions on how to dispose of the chemicals without damaging the environment. She proposed that labels containing such information be attached to the appropriate equipment. Her suggestion netted Dorothy \$50.

Several employees in the Technical Services Division, following the philosophy that "two heads are better than one", combined their ideas which resulted in several practical suggestions—each worth \$50.

One of the suggestions was submitted by William S. Cowart and Edwin L. Shropshire, who recommended that curtains be used around the metal "sand blast machine" to reduce the effects of glare and reflection on the machine operator. The sand blast machine is used to remove foreign material from metal.

Shropshire also "collaborated" with Harold Siegfried on two suggestions. The men recommended that a lock be installed on each side of the "Niagara Metal Shear" to hold platforms in place when cutting metal. Previous use of the shears caused the platform to back away, creating a gap and allowing metal shavings to drop into areas where reattachment was difficult.

They also suggested that a single arm precision center finder be attached to the "stripper machine" which is used to punch

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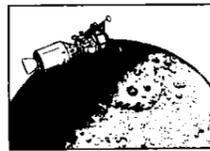


SUGGESTION AWARDS—Suggestion Awards were presented to a number of JSC employees by committee chairman Jack Kinzler (standing, far right) on November 1. Receiving awards are (top, L-R) Jerry Kilpatrick, Paul Kleotzer, William Cowart, Paul Moravek, Kent Castle, Fred Juneck, Harold Siegfried, and Edwin Shropshire; and (bottom, L-R), Robert Martin, Donna Tarpey, Dorothy Ludwig, and Joseph DeCorte.

ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS



Vol. 13 No. 26

Friday, November 22, 1974

Apollo 12 ALSEP 5 Yrs. Old; Still Going Strong

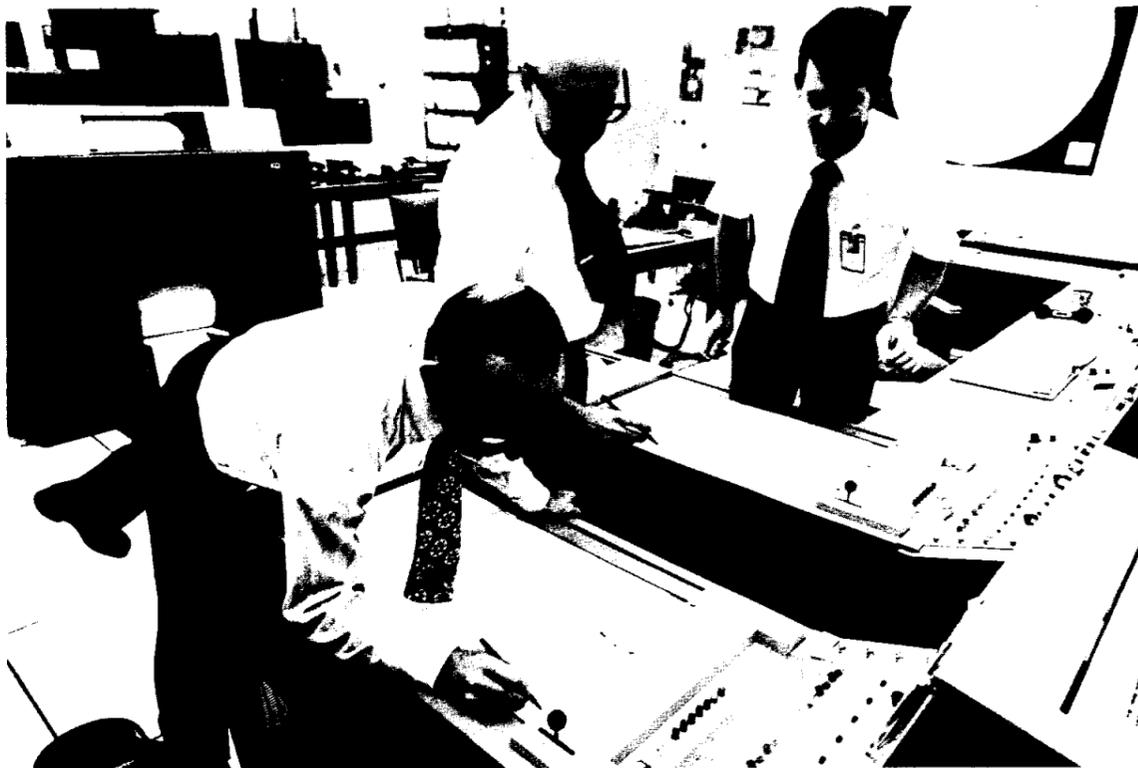
Five years ago, (November 19, 1969) two American astronauts placed and left on the moon a remote scientific instrument package. Five years and over 21,000 earth-to-moon commands later this set of instruments continues to respond with data about the moon's seismic activity, the energy hitting the surface from the sun and the moon's weak magnetic field.

Original specifications for the Apollo Lunar Scientific Experiment Package or ALSEP 12 called for the instruments to last for one year after the return of Apollo 12 astronauts Charles A. Conrad, Alan Bean and Richard Gordon. Don Wiseman, one of the men originally responsible for the hardware development, attributes the long life to basically simple design durable materials.

"It was a barebones design; basically sound," Wiseman said.

According to W. "Ike" Eichelman, chief technical monitor for the ALSEP, the basic ingredient in the longevity of the instrument packages is their atomic power plants. Due to several factors—the moon's environment, the cosmic irradiation, and others—the generating

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SUPPORT ROOM—Inside Building 30's ALSEP support room, Jack Urban, Bendix, Joe James, Philco, and Roy Keely, Bendix, annotate performance charts for remote lunar instruments. The ALSEP room operates several times a week in real-time support of data coming from the 5 ALSEPs.

JSC Announces UMP Expansion

Personnel Officer Jack Lister recently announced the expansion of JSC's Upward Mobility Program (UMP). Programs in UMP will include I.Q. (Increased Qualifications); GO (Growth Opportunity); and STEP (Specialty Training for Entry Professionals).

"Over the years, our concern has always been to improve employees' potential," Lister stated, "JSC has attempted to provide opportunities for lower-graded employees, many of whom are minorities and women, to advance to more responsible, higher-graded positions."

Lister stated further that as more emphasis is placed on upward mobility, increased effort has been exerted at the Center to develop new and meaningful plans which will encourage those at the lower-grade levels to work at their fullest capabilities.

As part of the UMP, JSC last October began a Career Mobility Program (CMP) which was designed to provide "bridging positions" for lower-graded employees who show potential and motivation for higher level jobs. CMP participants are expected to complete their training in January.

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System To Monitor Quality of Water

JSC has awarded a contract to the Boeing Aerospace Company for the development of an automated system which will monitor continuously the quality of water being discharged from waste treatment plants.

Currently, waste treatment plants rely on tests which require up to five days of laboratory time to determine the bacteriological contamination of their water discharge. The delay opens the possibility of contaminating lakes and streams before corrective action can be taken.

NASA's research activities associated with astronaut life support systems have resulted in the development of techniques for sensing bacteria almost immediately. Under the contract with Boeing, the space agency will determine the feasibility of transferring this technology to domestic applications.

In addition to the bacteria content, a complete picture of water quality requires the measurement of a number of other ingredients such as chlorine and oxygen. Presently, the monitoring system will use 11 sensors to detect them.

Many of the sensors are small membranes about the size of a nail head. They act as filters to select certain elements in the water for measurement. Electrodes, located on the discharge side of the membrane, determine the quantity of the element present in the water by measuring its electrical potential.

Another sensor uses light rays to determine the amount of suspended solid particles present in the water discharge. Higher levels of contamination allow smaller amounts of light to pass through it.

Bacteria content of the dis-

charge is determined by the use of photo electric cells which detect light. A chemical reaction is created in the sensor which produces a known amount of light. However, the amount of light produced is intensified if living cells, such as bacteria, are present. The strength of the light is in direct proportion to the amount of living cells in the water.

One of the key sensors in the monitoring system is the total organic carbon analyzer. It determines how much organic material remains in the water after it has passed through a plant's treatment system. The uncontrolled accumulation of organic material in lakes and streams would permit bacteria to feed and multiply. In the process, oxygen in the water would be depleted, robbing aquatic life of

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2 Cups of Efficiency, A Pinch of Dedication

"Two cups of efficiency, three heaping tablespoons of dependability, a pinch of dedication. Oh yes, don't forget to mix in three teaspoons of cooperation, and always add just enough good judgement. Combine these ingredients (and a few of your own of course) and the result..."

Well, the result for Roberta L. Hohmann was the Outstanding Secretary Award for November. Roberta has exemplified the "ingredients" of a remarkable secretary since she joined JSC in 1968. However, her performance in the Avionics Systems Engineering Division (ASED) is especially commendable.

She has served as secretary to William C. Bradford, Chief, ASED, since its organization in March, 1973. During the forming of ASED she was responsible for coordinating the working relationships of employees who were previously part of four other organizations. According to Bradford, Roberta's ability to maintain continuity of Division operation during a time of "hectic transition" was exceptional.

Since the Chief, ASED, is the

avionics liaison person for the Shuttle Program Office and other directorates and Engineering and Development (E&D) divisions, Roberta, as his secretary, has been given the responsibility of coordinating meeting schedules and preparing and routing memos, documents, Master Change Requests (MCR) and similar forms from the Shuttle Program Office to the appropriate divisions. Knowledge of various formats as well as familiarity with engineering level terminology are often required in carrying out these assignments.

One specific example of Roberta's competent performance is her support of the engineering and management staff in their review of Space Shuttle Requirements and the Orbiter Preliminary Design. Review Item Dispositions (RID's) required action from several divisions, other directorates and other Centers. Roberta catalogued the RID's, planned the reproductions, coordinated distribution, maintained action complete lists and informed appropriate personnel of any changes.



ROBERTA L. HOHMANN

Bradford remarked that the characteristic most essential in the performance of Roberta's complex assignments and the "one most appreciated is her attitude."

"Her patience and cooperation in working with managers and their staffs are outstanding, her personal integrity and fairness are unquestioned, her judgement unusually keen, and her sense of responsibility is an excellent example for Division secretarial support to follow." Bradford commented.

UMP

(Continued from Page 1)

The expansion of the UMP will involve more employees and will, according to Lister, "give them a chance to utilize existing abilities, improve qualifications and increase potential."

I.Q. will allow its participants to attend school up to six hours per week on government time; GO, which will replace Career Mobility, will continue to provide bridging jobs between clerical and professional positions; and STEP will provide professional positions for otherwise "dead-ended" clerical or technician employees.

Further details about the programs will be released soon by the Employee Development Branch.



INCOMING/OUTGOING OFFICERS—Pictured above are the incoming and outgoing officers of the EAA Executive Board. From left to right standing are Bill Forsyth, Bill Jones, Jerry Jones, Ike Spiker, Jack Boykin and Jim McBride. Left to right seated are Norma Godeke, Kathy Spencer, Ursula Nuechtern, Loreta Bradley, Rachel Windham, Donna Tarpey, and Geraldine Taylor. Not pictured, Dawn Hoyle.

EAA Attractions

OFFICERS ELECTED

The Twelfth General Assembly of the EAA met at the Gilruth Recreation Center on November 5, 1974 to elect new members to the Executive Board for the coming year. Elected for two-year terms were James McBride, President; Ursula Nuechtern, Secretary; Jack Boykin, vice-president Athletics; Jerry Jones, vice-president Facilities; and Donna Tarpey, vice-president Youth Activities.

Elected to one-year terms were Geraldine Taylor, vice-president Clubs, and Rachel Windham, vice-president Promotions.

Retiring officers were Bill Jones, president; Ival Spiker, vice-president; and Norma Godeke, Vice-president Clubs.

BLOOD DRIVE

Lockheed has scheduled a blood drive for November 20 and 26th at the Gilruth Recreation Center. Any JSC Employee who was unable to donate during our last drive on September 18 may do so during the Lockheed Drive. The donation will go into the JSC Blood Bank. Call Janie Guillen at 488-0080 or X-250 for an appointment.

CHRISTMAS

The annual Children's Party will be held December 14, 1974 from 1-3 p.m. in the Building 2 Auditorium. Only 500 tickets are available and none will be sold at the door, so don't disappoint your children by bringing them without tickets.

Entertaining cartoons will be shown at the party and Mr. and Mrs. Santa Claus will make a grand entrance. Santa is willing to take a photograph with each child—these pictures will be available to take home the day of the party.

A gift will be distributed to each child.

Bring your children and stay a while. You may even enjoy the cartoons yourself! If you do not stay, please pick your children up at 3 p.m. Leaving them stranded at the door can erase all the fun they will have at the party.

The JSC Christmas Dance Tickets sold out in just one week. With 700 tickets sold this will be the second largest dance the EAA has sponsored.

BASKETBALL LEAGUE

There will be an organizational meeting at the Gilruth Recreation Facility December 2, 1974, at 5:15 p.m. to form men's basketball leagues. This will be the deadline for entering teams. The leagues will start in January 1975.

BASKETBALL OFFICIAL'S WORKSHOP

There will be a basketball officials' workshop December 9-10, 1974, at 5:15 p.m. in the Gilruth Recreation Facility. Anyone interested in officiating the upcoming basketball leagues must attend these meetings.

TICKET CORNER

Six Flags—Closes December 1, 1974. Adults \$5.60, Children \$4.70.

Lion Country Safari—Year Round Free Safari Cards Good for 10% discount.

Sea Arama—Year Round—Adults \$3.00, Children \$2.00.

ABC Theatres—\$1.00 Coupon Good for admission to any ABC Interstate Theatre.

Dean Goss Dinner Theatre—Good through January 31 BUT not good during December—\$15.00 coupon for 2 (\$20.00 regular).

Houston Aeros Hockey—All Season \$4.40 gift certificate (5.50 seat)

Disney Magic Kingdom Club—FREE.

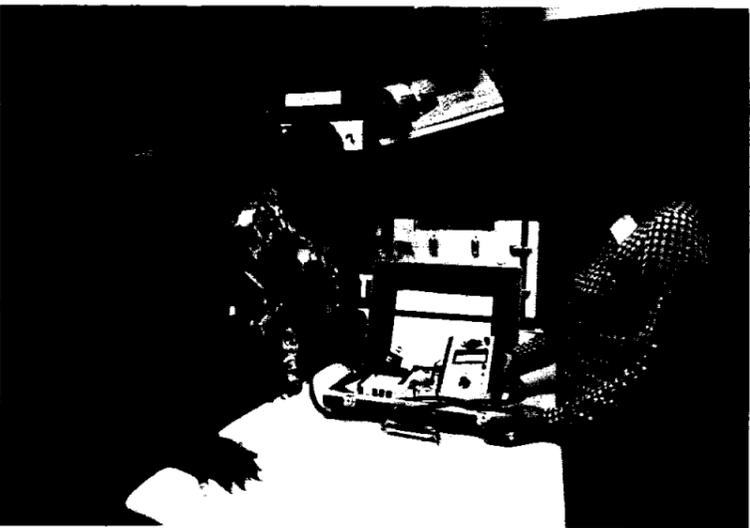
JSC Children's Christmas Party—December 14, 1974—\$1.00.

TABLE TENNIS

Don't forget the JSC Table Tennis Club Semi-Annual Open Table Tennis Tournament tomorrow, November 23, from 9:30 a.m. to 4 p.m., at the Gilruth Recreation Center. A few openings remain. If you are interested Call Steve Jacobs x3561.

JIMMY WARREN

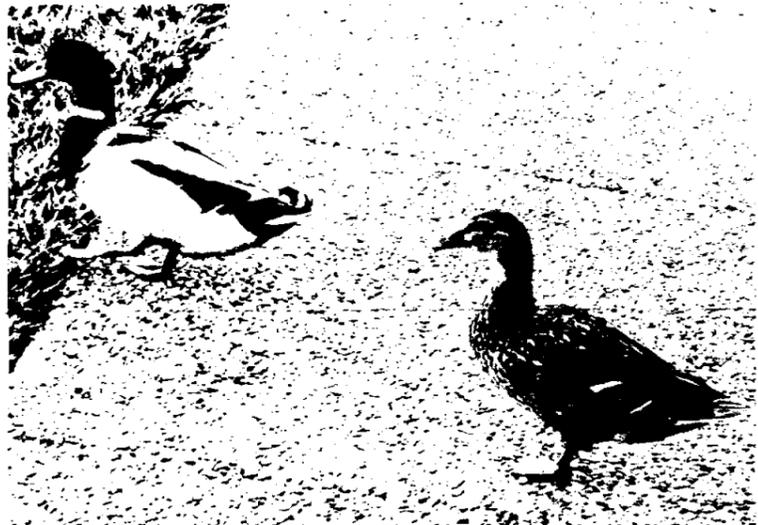
Standings as of Nov. 14, 1974: 1st Chokers 32½-11½ and Fireballs 32½-11½, 3rd Spoilers 27-17 and Pin Pounders 27-17, 5th Strikeouts 23-21 and Ball Busters 23-21, 7th Jokers 21½-22½, 8th Hexes 21-23, 9th Mixers 20-24, 10th Alley Oops 19-25, 11th Hertz 16½-24½, 12th Clowns 15½-28½, 13th Team X 14½-29½, 14th Ascenders 15-29.



CLINIC ON WHEELS—Patient monitoring equipment in the Mobile Health Unit (MHU) of health care system being installed on the Papago Indian reservation in southwestern Arizona is examined by three members of the Tribal Health staff during the MHU's November 8 visit to JSC. Left to right are Tribal Executive health Staff chairman Cecil Williams, Community Health Medic (CHM) Irene Wallace and CHM Rosemary Lopez. The MHU stopped over at JSC while en route to the 4300-square mile Papago reservation west of Tucson.

No Lions, Tigers, Bears--But Almost

He's out of time, out of place—but he pays no heed. Dating back to Biblical times, this little burrowing, toothless mammal moseys along his way amidst buildings in which some of the most advanced technological studies and experiments are taking place.



But the antithesis of an old species of animals and of our very modern site for design, development, and testing of the spacecraft and associated systems for manned flight does not end with the armadillo.

Bounding across a freshly rained-on green lawn comes the famous Texas jack rabbit with its very long ears and long hind legs. He stops to peer at his many admirers; his tan ears shoot up in the air, his nose wiggles as he sets himself up on his hind legs—and not wasting another moment, but taking long enough to be well admired—he proceeds on his bumpy path.

A misty, rainy morning in late November sets the mood for the eight-point buck. Avid hunters/NASA employees find it exasperating to have been hunting all weekend with no luck. Then, upon their return to the "tame and civilized world of work" and out of the "unexplored" wooded hunting areas, they spot the much sought after buck as he

walks calmly across the street. With a 180 degree turn of the head, he looks pretentiously and arrogantly at the "hunter", seeming to know he will not be shot at.

These are only a few of the many kinds of wildlife that can be spotted on site and in surrounding areas. Coyotes, squirrels, possums, and some cows still abound in the area and can occasionally be seen. Our warm weather-seeking ducks are commonly seen either waddling through the pond or strutting down JSC sidewalks and lawns bothering visitors.

But this influx of animals was not started in September 1963, paralleling with the opening of the Space Center. Long before Houston was chosen as site for JSC, the land now covered with over 100 buildings was part of the Jim West Ranch. The 30,000-acre ranch extended from the Clear Lake home site to Ellington Air Force Base and surrounded the Armand and Horsepen Bayous. It was used for raising cattle and for maintaining a game preserve for deer, turkey, pheasant, quail, peccary, and prairie chicken. A ten-acre private lake adjoining the West mansion, (now the Lunar Science Institute), was always stocked with fish.

West, who started in the lumber business later to purchase the South Texas Lumber Company, was at one time a partner of H.R. Cullen in the oil business and owned the Dallas Journal and the Austin Tribune. His 17,000 square-foot mansion and



CATTLE—A herd of cattle photographed in 1962 showed interest in the invasion of their turf, their lunch, when construction of JSC buildings began.

property were sold to Humble Oil and Refining Company (now Exxon U.S.A.) at the price of 8½ million dollars in 1938. Deeded to Rice University in 1957, the initial 1000 acres were donated to NASA with the other 620 acres purchased for the Johnson Space Center. Construction of Clear Lake Forest and Clear Lake City on other parts of the West Ranch began in the middle sixties. Construction of Bay Area Boulevard in 1967 cut the present park site in half and made the bayou accessible.

Plans for real estate development prompted movements to preserve and create wilderness parks. Land, vegetation and wildlife of over 3500 acres remained untouched.

Our "JSC animals", then, are a welcome and good sight. It's great to know that ultra modern and futuristic technology can blend in with a touch of the untame and yet, gentle old.



Club Plans Central American Tour

The Aerospace Employees Cultural Club has scheduled a trip to Panama, Costa Rica, Guatemala and El Salvador leaving Houston on Thursday, February 13, 1975 and returning on Wednesday, February 26 (Monday, February 17 is a holiday).

The cost is \$425, double occupancy, \$475, single occupancy, and includes all airfares, deluxe hotels, baggage and airport transfers.

A deposit of \$100 is required by December 20, 1974 with full payment due January 8, 1975.

Movies and information will be presented Thursday, December 12, at 11:30 p.m. in the building 30 auditorium.

Plan now to see the San Blas Islands, Panama, home of the Cuna Indians and the famous

handmade molas, and tour the Canal Zone. See Irazu Volcano, Costa Rica, and get bargains at the Chichicastenango, one of the most fabulous Indian markets in Guatemala. Also in Guatemala, view the breathtaking beauty of Lake Atitlan and explore Tikal, largest Maya city in the world, a must experience!

For more information call Helen Statz, X4039 or Tom Gallagher, X02281.

Haley Award

(Continued from Page 1)

data on the solar processes and Earth's resources."

The Haley award consists of a \$500 honorarium and for each astronaut a medal and a certificate.

Roundup Swap-Shop

Swap Shop advertising is available to JSC and on-site contractor personnel. Articles or services must be offered as advertised, without regard to race, religion, sex or national origin. Ads should be 20 words or less, including home telephone number. Name and office code must accompany, but need not be included in ad copy. Typed or printed copy must be received (AP3 Attn: Roundup) by Thursday of the week before publication.

MISCELLANEOUS

Chain saw, Sears, 17 in, 5 yrs, \$35. 944-4997. Ward's 10" radial arm saw w/ sander, dado, and router attachments, \$175. Rippstein, 487-2415.

North face mummy style sleeping bag, 25-65 degrees temp range, ripstop nylon, 1 mo old, xint condn, cost \$77.50, make ofr, Minette, x3981.

Bass guitar and amp w/ 2 fifteen in JBL speakers and cabinet, \$225 ea or \$400 all, 534-3243.

Antique steamer trunk \$15, milk can \$12, assorted antique ceramic jugs, \$7, antique wooden wall phone (wired ready to install) \$150, 554-3866.

VEHICLES

1973 Buick, 250 Motocross bike, xint cond, gd for trail bike, Mary Yarbrough, 723-5807, x2789.

1966 MG B, \$695, N. Schulze, 422-5636. 1300 cc VW eng, recent overhaul, nw cltch, no muffler, \$150; 1963 VW eng, recent overhaul, body dent, nds paint, drives fine, \$300. N. Botes, 471-3709, x2131.

1971 Dodge Demon, man transmn, rad, heater, gd cond, \$1,000. Miglicco 331-4235. Motorcycle, 70 Suzuki, TC90, gd shape, starts easy, gd running condn, 8-spd dual range trans, licensed, \$190, Speier, 333-2263.

47 Willis Jeep, \$850, Bradley, 585-3144. 74 Honda CB 550, Z600 mi, w/ floor boards, lug rack, custom seat and cycle guard alarm, \$1400, 334-4298.

74 Ford-F-100 pickup, 6,000 mi radio, standard, 8 cyl, styleside, xint condn, \$3200 or bst ofr, 333-3642.

Credit Union Repos: 72 Triumph TR6, radio, tape deck, 61.5k mi, recently overhauled, nds minor body and mechanical repair, minimum anticipated bid, \$2,050; 74 Suzuki TS250 L, nds some work, bids will be taken on vehicles thru Thurs, Dec. 5, 1974, interested persons should contact Georgia Bennett, 2066, for bid forms and inspection appointments.

HOUSEHOLD ARTICLES

Wrought iron, wood bar fr Mex, 3 shelves, xint for TV stereo unit, \$85. Whittington, 488-4394.

Small Wulitzer 77 key spinet w/bench, \$225. Sayers 333-2395.

Large screen color t.v. consl nds repair, make ofr, 946-6551 aft 6.

PROPERTY & RENTALS

Lk Livingston waterfnt, ½ acre lot, wooded, pool, utilities, dev commty., invest/build, \$22,500. Millican 488-2384.

Alvin, 5 or 10 acres, fnced, gd drainage, \$1035 per acre, 482-3989 aft 6 p.m.

CLC Oakbrook, 3-2-2, 1700 sq ft, 6% FHA loan, \$186/month, Jones, 488-3208.

BOATS

Lido 14 sailboats: Info. on prices and cond. of used Lidos for sale by owners, R. Hoover, 334-2392.

WANTED

Will pay 3 times face value for 1964 & earlier 10c, 25c, and 50c 488-2384.

Set of used ladies' golf clubs, Judy Alexander x3281 or 333-4684.

Full size cello for student, must be reasonable, Bates, 944-4687.

Water Quality (Continued From Page 2)

this life-sustaining element.

In the measuring process, a microscopic quantity of water is burned instantaneously. The rapid burning converts any organic material in the water to carbon dioxide which can be sensed by an infrared analyzer.

The flow of data produced by the sensors will be controlled by

a Boeing-developed acquisition system, which will automatically monitor and record the readings of each sensor every 12 seconds.

The equipment is being installed in a 10-by-14-foot trailer to permit field testing at selected municipal water treatment facilities.

Center Employees Receive Awards

A number of JSC employees in the last several months have received Quality Increase and Superior Performance Awards.

Receiving Quality Increase Awards were Edward K. Fein, AM; Edward Barker, AP; James C. Young, Robert E. McElya and Maynard C. Dalton, EA; James

C. Stokes, Jr, FA; and Frederick J. Southard, JA.

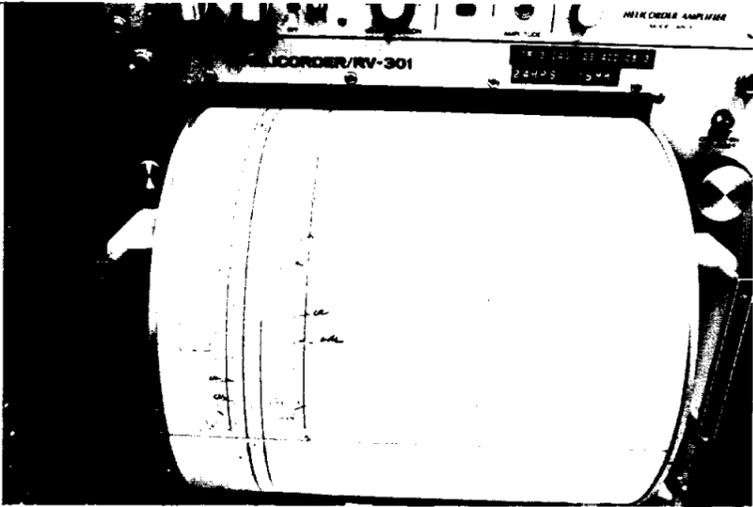
Superior Performance Awards went to Judith Boin, AP; Joyce H. Koplun, Ralph E. Graham, Marion W. Hix, James K. Hinson, and Leland C. Norman, EA; and S. Jean Alexander, NA.

ROUNDUP

NASA LYNDON B JOHNSON SPACE CENTER HOUSTON TEXAS

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

Editor: Janet Wrather Photographer: A. "Pat" Patnesky



This drum recorder is one of several which record data from the remote ALSEPs in place on the moon's surface. Each of the recording devices can be adjusted to record data from any of the experiments. This drum device will store 24 hours worth of data on a single sheet. Devices like this aid NASA and Bendix engineers and scientists in analyzing problem areas with the instruments.

Innovative Suggestions (Continued from Page 1)

holes in metal. Adoption of this idea alleviated the requirement for the manual changing of two separate attachments, one weighing approximately 40 pounds.

Another suggestion from Jerry T. Kilpatrick of Ground Data Systems, proposed that badging personnel located in the Building 30 lobby be authorized to issue temporary badges (during Skylab). Prior to adoption of this suggestion, personnel requiring temporary badges were required to obtain them from Building 100 or from Building 1. Jerry received an award of \$35.

Fred Junek, Technical Services, also received \$35 for his ideas on better "heat treat operations". Junek devised a tube that could be placed at the bottom of a quench tank (used for cooling metal) which improves circulation and cooling.

Awards of \$25 went to Donna A. Tarpey of Data Systems and Analysis; Paul H. Kleotzer, Technical Services; and Kent Castle, Control Systems Development.

Tarpey recommended that

floor numbers be visible from the elevator doors on each floor level in Building 1. The Engineering Division adopted the idea and floor number signs are now available on the edge of elevator doors on each floor.

Kleotzer proposed that a crosswalk be painted on Fourth Street for the safety of employees who had to temporarily use the Building 9 parking lot because of building construction.

Castle suggested that a lay-out map of the JSC Technical Library be placed above the reference catalog file to increase efficiency and enhance the use of the library.

The Awards office urges all JSC employees who have worthwhile suggestions to mail Form 624 to AH/5.



Apollo 12 ALSEP 5 Years Old

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units have actually performed better on the moon than ever predicted using simulating environments on earth. Eichelman estimates that ALSEP 12 will last at least 2 more years, or 7 times its original life expectancy.

The need for remote data from the moon centered about certain questions best answered with continuing data from which a trend could be established. Questions like what is the moon's internal structure, what processes are responsible for the present structure of the lunar surface, what is the pattern and distribution of seismic activity on the moon.

The ALSEP series which included similar packages for Apollo missions 14 through 17, was designed to return lunar scientific data to earth in areas of geology, geophysics, geochemistry and astrophysics.

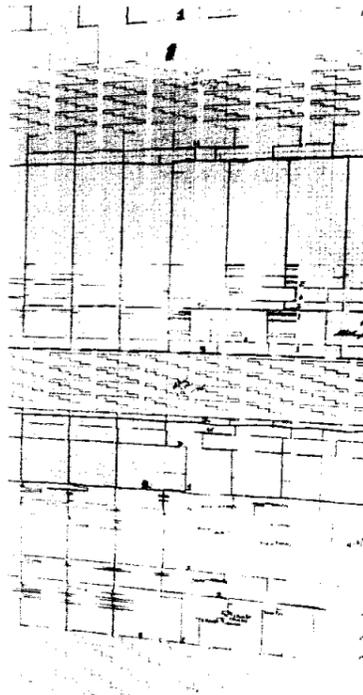
Each ALSEP was carried to the moon in two compartments aboard the Lunar Modules and placed in position by the astronauts during their forays about the moon's barren surface. Although each ALSEP contained a number of identical instruments, each one was different in distinct ways from the others.

The instruments consisted of a passive seismic device, an active seismic array using mortar rounds to set up shock waves, two ion detectors, a solar wind spectrometer, a particle detector, magnetometers and instruments to measure heat flow from the moon's interior.

Dr. Palmer Dyal, a NASA lunar investigator at Ames Research Center in California, has derived measurements of the moon's magnetic field from the Apollo ALSEP magnetometers. His estimates show the moon's magnetic field to be about 1,000 times weaker than the earth's and the result of a probable one-

time magnetism. The earth's field, in contrast, derives from the internal structure of our planet. A powerful magnetic field is generated deep within the earth by the constantly rotating molten metal core. This core functions like a dynamo and develops a field measurable many thousand miles into space.

Dyal says "that the lunar magnetic field can be viewed as a sort of magnetic tape recording of conditions on the moon over 3 billion years ago." These investigations have also lead to other tentative conclusions concerning the interior structure of the moon. From magnetic data Dyal has figured the abundance of free iron on the moon at about 2.5 percent by weight. The earth, by contrast, is about 30 percent iron by weight.



Data from the ALSEP mass spectrometers is read directly on this chart recorder. Direct readings like this are helpful in diagnosing problem areas on the instruments. For instance one of the mass spectrometers has experienced high-voltage arcing recently. NASA and Bendix engineers have studied charts like these in an attempt to locate the arcing.

Signals received by the seismometers have definitely established the existence of moonquakes. These are associated with activity deep within the moon (700 to 1,200 km), and with shallow activity produced by thermal heating and cooling during the lunar day and night. A third class of seismic events may be associated with processes within the lunar regolith.

One of the most surprising results was the long duration and ringing nature of seismic signals from the moon—completely different from that observed here on earth. This is explained by the diffusive propagation of the shock waves as a result of intense scattering, particularly near the lunar surface. For this reason, seismic studies based on echo signals cannot be used to advantage on the moon, whereas they are common here on earth.

Other important findings based on the seismic data are that the lithosphere of the moon is 700 to 1,200 km thick, much thicker than the earth's. The moon's core is probably near the melting point. Scientists, however, are waiting for a large meteorite impact similar to one which occurred two years ago to confirm their theories about the moon's core.

The ALSEP instruments have also been successful in obtaining a better picture of the earth's magnetosphere—a realm of trapped particles. As the earth orbits about the sun it is continually in the flux of high energy particles emitted by the sun.

Data from the 5 ALSEPs is received by NASA's tracking network 24 hours a day. This information is stored on computer tapes and mailed to the Johnson Space Center. In addition to the recorded data, NASA also monitors the instruments live during selected periods.

JSC Aircraft Operations Flies Project Airstream

The Johnson Space Center Flight Operations Aircraft Division recently completed its first mission of Project Airstream gathering high altitude gaseous and particulate samples from the upper atmosphere in the western hemisphere with the NASA high altitude WB-57F aircraft.

High altitude air sampling missions are flown for the Atomic Energy Commission and the Department of Transportation with samples taken during three periods each year. The project requires that continuous particulate and intermittent gaseous samples be taken at four altitudes between 45 and 63-thousand feet in a north-south corridor from 75 degrees north to 10 degrees south latitude.

The air sample corridor begins over the Arctic circle ice cap off the coast of Alaska. It crosses that state on a north-south line, then parallels the west coast of

Canada, transverses the western United States exiting at Houston over the Gulf of Mexico, then crosses the Caribbean Sea and Panama to the Pacific Ocean. It continues over western Ecuador and the snow capped Andes Mountains ending at a point just north of Lima, Peru.

Samples collected on these missions are analyzed by AEC for the High Altitude Sampling program to determine the global distribution of atmosphere nuclear weapons test debris, both gaseous and particulate. The analytical results are made available to all interested parties through technical publications.

Particulate samples are obtained by passing the outside ram airstream through special 16-inch diameter paper filters. Gaseous samples are collected by compressing the outside air to 3000 psi and storing it in basket-ball size spheres. During each

flight, these sampling systems are capable of obtaining sequentially up to 12 particulate and 8 gaseous samples.

Aircraft Operations pilots and crewmen made 14 flights in a 17-day period from October 9-25 collecting the samples. The flights were staged out of Elmendorf Air Force Base, Anchorage, Alaska, Howard Air Force Base, Panama and Ellington Air Force Base. The aircraft crews logged 32,000 miles during the sampling mission.

The WB-57F aircraft two-man crew, a pilot and systems engineer, wear pressurized flight suits similar to those worn by the Gemini astronauts.

NASA 928, the specially configured WB-57F has a wingspan of 122 feet and is the only four-engine aircraft operated by a single pilot. The aircraft is capable of attaining altitudes in excess of 60,000 feet.

Additional air sampling equipment is scheduled to be installed on the aircraft this month in Albuquerque, New Mexico to enable the collecting of samples for the Department of Transportation Climactic Impact Assess-

ment Program. These samples will provide information on the effects of high altitude aircraft and rocket exhausts on the upper atmosphere.

Manager for the Airstream Mission is Charles Anderson.



SUITED FOR FLIGHT—Charles D. Anderson, project manager for the JSC Airstream mission is shown with his hand on the unit that is mounted on the underside of the WB-57F aircraft for collection of the samples for project Airstream. Charles F. Hayes (right) is one of the pilots that flew on several of the flights as the systems engineer. Both are attired in pressure flight suits required to fly this high altitude aircraft.