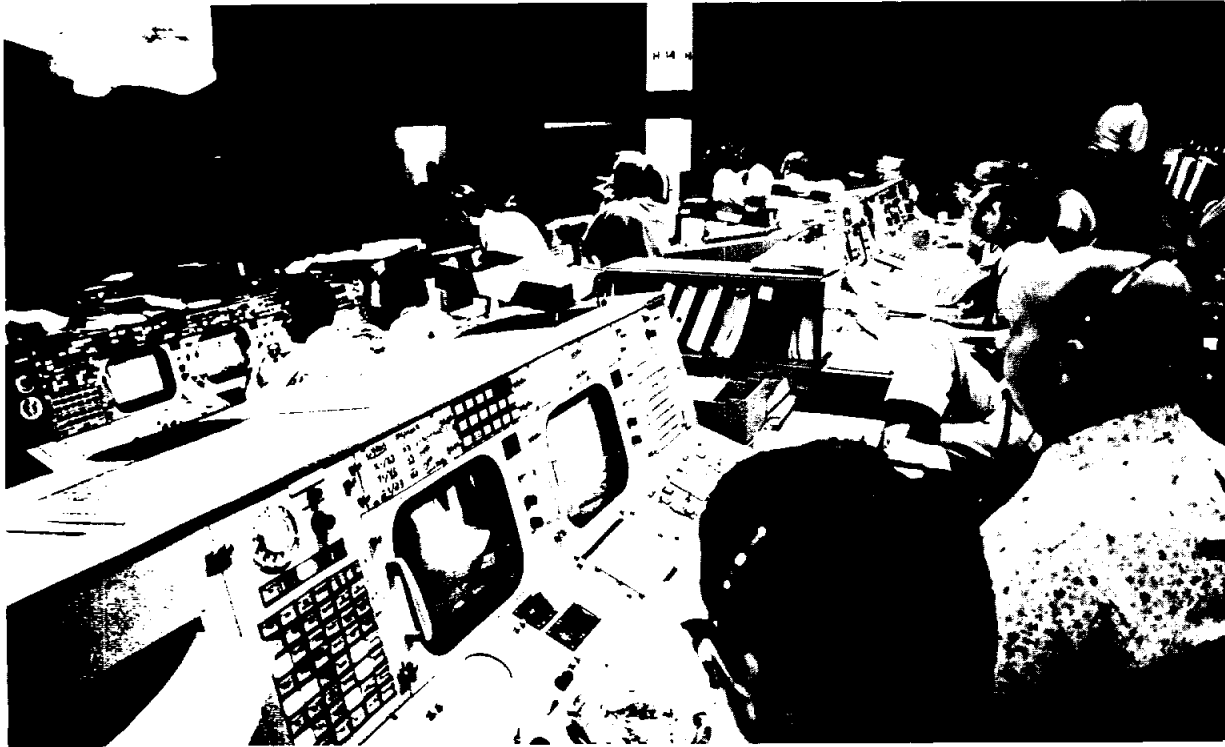




SL Attitude Control Problem Develops

Vol. 12 No. 19

August 3, 1973



FLY AROUND—Flight Director Phil Shaffer (back row, 2nd from left) and his team of flight controllers observe the Skylab 3 fly-around prior to docking. The spacecraft flew so close to the orbital workshop that the firing of the thrusters on the command and service module caused the parasol sunshade to ripple in the breeze.

At press time, mission controllers were investigating the leak in an additional thruster aboard the Skylab Command Service Module presently docked to the workshop.

While the equipment problem is serious, the crew is not in danger. The environment of the Skylab Workshop remains sound and will support the crew for as long as necessary to work out a solution.

A rescue capability is available in the Skylab program in which the next in line vehicle and crew could be used to fly up to SL and return with the crew, should that become necessary.

The crew is maintaining as near a normal mission in Skylab as possible while ground controllers assess the thruster problem.

Because of the problems the crew had in adapting to weightlessness, they have been work-

ing at a slow pace.

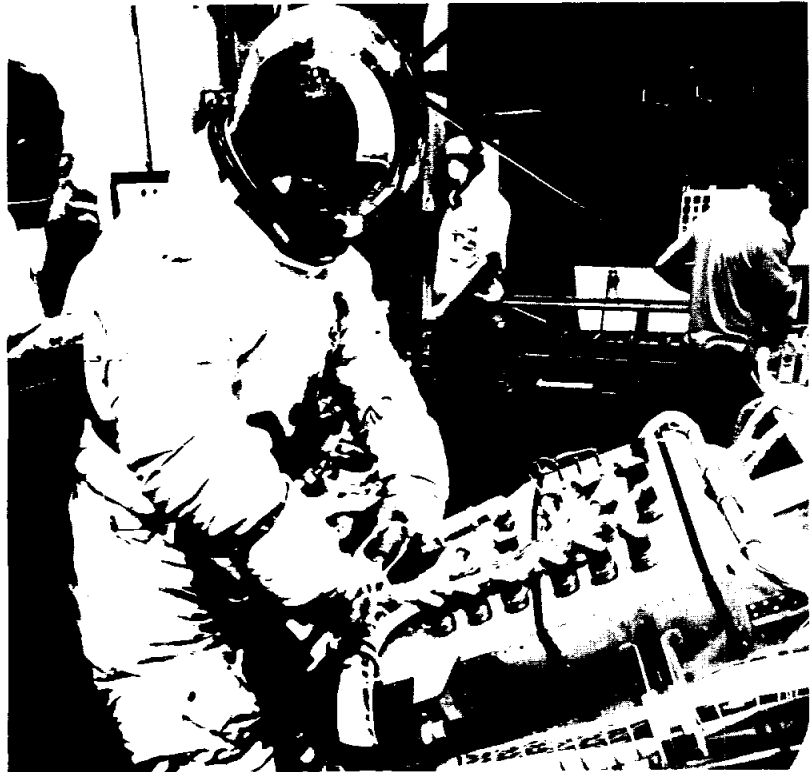
Dr. W. Royce Hawkins, deputy director for Medical Operations at JSC said the crew's reaction was nothing about which to be overly concerned. He stated that all Gemini and Apollo astronauts reported similar problems and explained that the SL-2 crew did not have the same problems because they were forced to spend the first few nights in the smaller Apollo ship.

The crew reported earlier this week that they were feeling fine. However the first spacewalk was postponed.

Some of the numerous experiments which are aboard Skylab have gotten underway.

Two of these experiments, designed to study circadian rhythm of pocket mice and vinegar gnats, failed due to a short circuit in the SO71-SO72 experiment package in the service

(Continued On Page 4)



PREFLIGHT TRAINING—Astronaut Lousma is seen practicing walk-through installation and connection of the rate gyro six-pack during preflight training at JSC. The SL3 crew carried with them a package of electronic equipment which will be used if needed to replace malfunctioning rate gyro processors.

SL Rate Gyro Package Available to Crew

The Skylab 3 crew carried with them a package of electronic equipment which will be used if needed to replace malfunctioning rate gyro processors (RGPs).

The Skylab cluster's attitude control system uses nine RGPs—three in each axis—to sense motion and provide that information to a computer which, in turn, furnishes signals that control the attitude of the space station.

The three RGPs in each axis are redundant—actually only one is essential.

At present one RGP has been turned off because it malfunctioned, while five others have overheated to some degree at

one time or another during more than two months the spacecraft has been in orbit.

A decision was made to carry components and equipment sufficient to permit a change of RGPs, should that become necessary.

No decision has been made to effect the change and probably will not be until and unless all three gyros are lost in one axis.

The package which the SL3 crew carried to orbit in the command module consists of six RGPs, mounted together in a single unit called a rate gyro augmentation package, and associated cables.

(Continued on Page 4)

Recreation Facilities Now Complete

The Employees Activities Association recently announced the completion of the initial phase of the Center's recreation facility.

Named in honor of Dr. Gilruth, former director of the Manned Spacecraft Center, the opening and dedication of the Robert R. Gilruth Recreation Facility will take place Saturday August 4, at 2 p.m. Dr. Gilruth will be guest of honor. JSC director Christopher C. Kraft will be guest speaker.

Open house will be held from



Dr. Robert R. Gilruth

2:30 p.m. to 5 p.m.; refreshments will be served following the dedication ceremonies.

The 27,000 square foot main building of the Robert R. Gilruth Recreation Facility can be divided into three parts. Part one is a spacious Assembly and Dining Room comfortably seating up to 450 persons, complete with a 20 by 28 foot dance floor, raised stage and an overhead projection booth designed to appear as a chandelier.

Part two consists of a full-sized combination basketball and volley-ball court that has been surfaced to accommodate directorate or division size dancing needs.

Included in part three is an ultra modern kitchen, fully equipped lounge and six individual meeting or conference rooms of various sizes.

Two large paved parking lots capable of handling up to one hundred twenty vehicles each are available for Center employee use.

On the grounds, three slow pitch softball fields have been constructed and are ready for use. Dugouts and bleachers are planned and will be added in the near future.

Three tennis courts have also been completed. More will be added as the need develops.

In addition, a separate facility support building has been constructed to house permanently assigned operations and grounds maintenance personnel and equipment necessary to assure the continuing operational success of the Robert R. Gilruth Recreation Facility.

ASTP Directors Say Plans Are On Schedule

Technical directors for the Apollo-Soyuz Test Project (ASTP)—Dr. Glynn S. Lunney for the U. S. and Prof. Konstantin D. Bushuyev for the U.S.S.R.—have reaffirmed that major milestones for the joint 1975 space mission are on schedule. They reviewed project milestones at the ASTP meeting held at the Center July 9-20, 1973.

The purpose of the meeting was to discuss technical matters, continue development of trajectories and flight plans, tentatively agree upon the scientific experiment program and familiarize cosmonauts assigned to the mission with the design and op-

eration of the Apollo spacecraft.

Further progress was reported by the working groups on the details of the crew activities plan, control center operations, trajectories and other operational aspects of the joint mission. Agreements reached in particular include:

—Familiarization of U. S. flight crews with Soyuz equipment will take place in November in the Soviet Union.

—A preliminary schedule of crew training aims for cosmonaut training in the United States in April, 1974 and in February, 1975, and astronaut training in the Soviet Union in July, 1974.

(Continued on Page 4)

Because a special format for the "Roundup" is being planned, no Swap-Shop advertisements will be accepted for the August 17 issue.

Also, on August 27, guided tours of the Center will be discontinued, because formal dedication of JSC will be held on that day. Self-guided tours will be permitted.



LOUSMA AND FAMILY—Astronaut Jack R. Lousma relaxes with his wife, Gratia Kay and their children, (l-r) Mary, 4; Timothy, 9; and Matthew, 7. Lousma is the pilot for Skylab 3.

ASEE Institute Completes Study

The annual American Society For Engineering Education (ASEE) Institute this summer is completing an engineering systems design study of hydrogen as an energy transport medium.

The team of eighteen faculty from 12 states and the Commonwealth of Puerto Rico is attempting to find the most economical system for producing, distributing, and using hydrogen as one part of a solution for the overall energy problems facing the world.

In addition, the team is trying to forecast the salient parts

of the environmental, political and legal climate that will exist over the coming 50 years. This forecast will help to determine the feasibility of changing to a hydrogen-based energy system to aid in conserving our hydrocarbon reserves.

The program is funded by NASA Headquarter's Office of Policy and University Affairs through a grant to the University of Houston. Technical and administrative direction is accomplished by University of Houston and Rice University faculty, and the University Programs Office

at JSC.

Dr. W. R. Downs of the Structures and Mechanics Division has been assigned to provide technical liaison between the team and Center management.

Study results will be presented August 16 at 9:00 a.m. in the auditorium of Building 30. The final report will be issued in October and a limited number of copies will be available for distribution through the University Programs Office.

Balinese Dinner Theatre Holds 2 "NASA Nights"

A play entitled "Last of the Red Hot Lovers" will be featured at the Balinese Dinner Theatre in Galveston, Texas August 29-30 exclusively for JSC employees.

Dinner will be served each night from 7 p.m. to 8 p.m.; the play will begin at 8:30 p.m.

Tickets are available at the JSC Exchange store in Bldg. 3 on a first come-first serve basis only. The theatre will accommodate 225 persons per night.

Tickets are \$5.50 each and will not be sold after August 24.



Take stock in America.



ALAN L. BEAN FAMILY—The wife and children of Astronaut Alan L. Bean are photographed at their home near JSC. Left to right, are Mrs. Sue Bean, Clay, 17, and Amy Sue, 10. Astronaut Bean, commander of SL3 was in training at the time the photograph was taken.

A Special Note of Thanks

To All NASA and NASA-Contractor Wives—A Special Thank You Thank you for being such a vital part of the team.

Thank you for warming the dinners and soothing the children when husbands come home late.

Thank you for handling the minor problems and some very major ones when the men in your lives were unreachable at NASA.

Thank you for simply being there, smiling and supportive, sometimes concealing the anger and tears when they're about to spill over.

Thank you for being very special women, who make it possible for our very special men to do their jobs so well.

Lee Kerwin

(Mrs. Joseph P. Kerwin)

Wife of the Science/Pilot Skylab I

Kraft Presents Awards to Employees

JSC director Christopher C. Kraft, Jr. recently presented Length of Service Awards to 25 Center employees.

Nine employees from Engineering and Development were honored with awards. These employees include Edward L. Hays, Lewis R. Fisher, Mevy H. James, Eugene K. Wendler, 30 years each; Rene A. Berglund (retired), John H. Kimzey, John H. F. Kornegay, James B. Marsh and Howard W. Osborne, 25 years each.

Six employees from Center Operations received Length of Service Awards. Clifton Carr (retired), George J. Mallios and Andrew M. Sea received 30-year service awards. Augustus Bower, Ruby L. Phillips and Robert E. Thrower received awards for 25 years of federal employment.

Five Flight Operations employees received awards for 30 years of service. They are Clayton M. Bergman, Charles W. Busch, Thomas A. Dorrough, Jack Funk and Arnett E. Kilpatrick.

Administration and Program Support had three employees who received awards. These employees are Gordon L. Hughton and Nickolas Jevas, 30 years each, and Dorothy Newberry, 25 years.

Merritt J. Bender of Science and Applications received an

award for 25 years of service and Clarence Meyers of Program Operation was awarded for 30 years of service.

Rep. Jordan To Speak At Luncheon

Representative Barbara Jordan will be the guest speaker at the annual JSC Summer Aid Award Luncheon scheduled for August 9, at the Nassau Bay Inn.

A native of Houston, Miss Jordan received her B.A. degree in Political Science-History in 1956 from Texas Southern University, Magna Cum Laude, and graduated from Boston University School of Law in 1959.

When Representative Jordan was elected to the Texas Senate in 1966 representing District 11, she became the first black since 1883 to serve in that capacity.

In March, 1972, she became the first black woman to preside



REP. BARBARA JORDAN over a legislative body in the United States when she was un- (Continued on Page 4)



GARRIOTT AND FAMILY—Scientist-Astronaut Owen K. Garriott poses for a family portrait with his wife Helen and their four children, (l-r) Randall, 18; Richard 12; Linda 6; and Robert 16. Garriott is science-pilot for Skylab 3.

ATTENTION!

A meeting to organize a women's softball league will be held August 16 at 5:00 p.m. in Bldg. 13, room 108.

All teams interested in playing in the league, scheduled to begin the first week in September, should complete the form below and forward to I. K. Spiker, ES5, before August 14, 1973.

TEAM NAME -----

TEAM MANAGER -----

PREFERRED NIGHT -----

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

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.

HOUSEHOLD ARTICLES

Rural Americana dark pine peasant table w/2 benches, 2 chairs, xlnr cndn, Hannigan, 534-4292.

Dyna SCA-35 stereo integrated amplifier, tube type w/ walnut case, prfct 488-3966.

Early American couch, 2 chairs, ottoman, Silvertone color TV combination consl, \$250, 485-3521 aft 5.

King size hbd, tufted gold velvet, li new, \$50, Karen, 6321.

Sears washing machine, works, \$20, Doherty, 488-0182.

Sofa-bed, Kroehler, makes dbl bd, med green/brown specks, li nw cndn, 68" wi x 33" deep, \$99 944-8709.

Walnut table w/ chrome legs, 4 chrome and leather directors chairs, matching buffet, xlnr cndn, make offer, Goodwin, 623-8368.

69 Zenith portable 21" b/w tv, xlnr cndn, \$75, Germany, 643-4456 aft 6 p.m.

Mediterranean bdrm suite, mattress, bx springs, dressers w/ mirror, nite stand, light wood, \$180, 337-2153.

Antique iron pots, butter churns, hand irons, glasslid jars (pint & quart sz) school desk, brass-plated 40-qt milk cans, 471-6798.

MISCELLANEOUS

12 ga. Remington 870 pump shotgun, 30" bl w/ variable choke, \$80, 488-2182 aft 6 p.m.

Canon TL SLR body, Soligar 135mm tele, Soligar 35mm W. A. filters, cases, etc, xlnr, \$135 488-3966.

Sears 9" radial arm saw w/ stand, \$75, 488-2652.

Two 7.35 x 14 wsw tires used 4500 mi, xlnr cndn, \$25, 941-3039.

Ariens riding mower, motor replaced last year, \$60, McKee, 483-3048 or Baytown 424-7927.

B&D batt powered mower/charger, 150 spalding matched 1-2-3 woods, \$10.

Masley vertical, \$25, heater cheyenne, xmtr, \$40, lm frequency meter, \$25, Lindsey, 488-0517.

2 twin foam mattresses w/ matching bx springs, \$60, 1 twin innerspring mattress, box spring, \$20, ce skates, new, boys Hockey, sz 5, \$9, carpet, beige, 5'x7', \$8, boys Schwinn bike, \$15, Sunbeam toaster, \$2, 488-4005.

1 new blk wall radial tire & rim, size 165 SR 13, bst offr over \$25, 433-0061 aft 6 p.m.

Tent, camel 10x14, 6 ft walls and 8 ft center, floor and awning w/ poles and stakes, xlnr cndn, \$80, Price 471-3314.

Ludwig drum set, 8-pieces, 4 drums, 3 cymbals, high hat, seat, floor, pedal, complete, reduced, 488-1326.

Dynaco QD-1 Quadaptor, converts 2 channel to 4 channel stereo, new, wired, \$15, Ragan, x 2891 aft 5, 481-0408.

58mm Skylight filter (1A) Brand new in box \$4., Handley, 482-7041.

Avon fairing, \$75, 20" boys bike, \$5, BMW saddle bags and rack, \$20, 488-4120.

Polaroid 230 camera, li nw, w/ flash, portrait kit, film bulbs, delux carrying case, other accessories, \$50, Handley, 482-7041.

Selmar Mark 7 Baritone saxophone (without low A) 6 yrs old new, \$1200, now, \$500, Dave, 923-5806.

Blc/Decker Industrial router/planner kit w/ metal carrying case, li new, \$90, Sears motor, 1/2 hp, industrial, 120/240 v, \$55, Sears Router, industrial, \$35 471-6798.

VEHICLES

70 Yamaha 350, gd cndn, xlnr street bike, \$450 or reasonable offr, Huss 482-7896.

70 Plymouth 4-dr, v-8, auto/tran, gd point, tires/gas mi, \$1700, 488-2665.

Camping trailer, 68 Starcraft Constellation, sleeps 8, stove, ice box, xlnr cndn, \$1195, Cowan, 944-1551.

71 Datsun pickup, radio, lw mi, \$1500, Don 534-2882.

70 Plymouth sta wgn, air, gd cndn, \$1195, 534-2882.

Rent, 72 Jayco ht, folddown camper, kitchen, ice box, sleeps 8, \$10/day, \$57/wk (\$25 minimum) Kilbourne, 482-7879.

71 Rebel, a/c, p/s, 4-dr, bst afr ovr \$800, 331-5667 aft 5.

64 Jaguar XKE convertible, 50,000 mi, xlnr cndn, \$2000, 925-3654.

72 Grandville Pontiac, 2-dr coupe, fully equipped, 10,000 actual miles, nvr damaged, sell or trade, 332-3027.

73 Vega sta wgn, auto, air, less than 3000 mi, Bishop, 483-3518 aft 5 p.m., 482-2745.

70 Triumph Spitfire, oval SU carburetors installed, 25 mpg, fast wire wheels, \$1,100, Dennis, 483-3036.

70, 19' self-contained trailer, new ac, xlnr cndn, \$2250, aft 2:30 pm or on wkends, 473-0117.

69 Ford LTD, 4-dr, pwr, air, stereo, gd cndn, Levine, 488-6796 evenings.

16' Airstream travel trailer, Custom blt, 66 Mustang, auto air, 6 cyl, 67 Lincoln Continental, 2-dr, Haldeman, 554-2181.

71 Honda 350 SL, lw mi, gd cndn, xtra helmet, sprockets, 334-2894.

70 Honda C170 H, minitrail, \$140, Thompson, 332-2229.

70 Chev El Camino, air, ps, pb, auto, air levelers, trailer hitch & brk/tail light plug in, 37,000 mi, \$2195, Stringer, 488-1403.

70 GTO, 4-spd, 400 cu in, custom xtras, air, tape deck, AM-FM radio, new tires, lw mi, 1 owner, 334-3357 aft 6.

67 Mercury Sta Wgn, 9 pass, loaded, average cndn, wholesale plus \$100, McConnell, 944-5680 or 941-0489.

72 Westfield Ward tent camper, mattress, carpet, spare, sleeps 4 li new, \$325, 485-1486, Humphries, 4571.

53 Chev, 2-dr, orig, 74 K mi, standard shift, xtra clean, \$1,000 71 Kawasaki, trail boss 10 spd, 2100 mi, clean, \$300, 59 VW pan and trans axel, ready fr Dune Buggy modification, nw brks, wh bearing,

wh cyl, engn doesn't run, \$75, 482-3100 aft 4:30.

69 AMX, air, pwr, engn and trans gd, nds no major repair, orig owner, 483-5036, 333-3372.

PROPERTY AND RENTALS

Waterfront home, Lazy Bend, Kemah, 2-story, 3-3-3, 538-1744 evenings.

Rent, 3 bdrm, cntrl air, fnced yd, garage, patio, carpet, drapes, Alameda Mall area, 941-7634.

Fairmont Park, yearly lease, 9907 Old Orchard brick Colonial, 3-2-2, fnced yd, cntrl air, pool privileges available, \$195/mo, 1st and last month's rent and \$75 damage deposit required, 471-3762.

Lease, exec home, 2-story Western Colonial, 4-2 1/2-2, beautiful wooded lot, profes landscaping, private boat launch facility AM-FM ntercom, huge den w/ fireplace, formal living & dining areas, \$424/mo, 337-2153.

Furnished bachelor apt, available during Sept & Oct to responsible adult, \$145/mo, 483-5036, 333-3372.

4-2-2 Fairmont pk, covred patio, cntrl h/a, fnced 483-3751.

Home near Livingston, Crystal Lakes estates, modern conveniences, 1024 sq ft, lot 62x210, low taxes, many trees, well drained, Heyer, 483-5156.

Rent, 4 bdrm house in Nassau Bay, furnished, available Aug - Dec, \$350/mo plus utilities, deposit required, 333-2241.

Custom home in Dickinson Pines, 3-2-2 Bayou access, nw carpets, paint, fnced yd, Cul-De-Sac street 474-4722.

Bayfront home, south of LaPorte, one or two family units, 6 yrs old, many xtras, 471-6798.

1/2 acre lots, Roman Forest Section III, priced below market, Lake Conroe water front townhouse lots in Caple Conroe Section 1, private owner, 471-6798.

PETS

AKC collies, Lassie type, sable/white, 488-4109.

Gelding quarter horse, 5 years old, \$200 482-7858.

AKC reg blc laborador puppies, 6-wks, shots, parents hunt \$50, \$60, Donahoo, 925-2139 aft 5:30.

Dachshund, male, 2-yr-old, blc/tan, AKC, \$45, MI 9-2897.

BOATS

Senior Dolphin sailboat, 5 years old, \$200, 334-3044.

WANTED

Person to join carpool, meet at Stella Link & Loop 610, 8-4:30 shift, 723-8918 or 721-1432.

Standard 26" ladies bike, gd cndn, 483-4488, 488-2843, evenings.

Tricycles, any size, needed for use during JSC All Star Picnic, Sept 8, 1 adult ticket will be presented for use of tricycle, or \$2.50 cash, Hayes, 6211:

Outstanding Secretary Award To Be Given

An Outstanding Secretary Award was recently established to recognize and honor JSC secretaries who have made "exceptional contributions to the effective operation of JSC through professional competence and personal dedication."

This honorary award will be presented monthly to a permanent JSC employee who has a minimum of 1 year's service with JSC and is assigned to a position as a secretary, clerk stenographer, or secretary typist. The award will consist of a suitably etched Fotofoil desk plaque and \$100.

Candidates may be nominated for an exceptional one-time accomplishment or for outstanding efforts that have contributed significantly to the effective operation of the Center during the previous year.

Eligibility requirements and nomination procedures will be furnished to major organizations in the near future.

For the first Center award,

nominations will be accepted by AH5/Awards Office for selection of an outstanding secretary for the month of September. Thereafter, nominations will be due on a quarterly basis.

Spacemobile Goes To Museum

The NASA sponsored Spacemobile program will present free lectures and demonstrations at the Houston Museum of Natural Science August 1-31.

NASA lecturers will give presentations at 11:00 a.m. and 3:00 p.m. Tuesday through Friday and 3:00 p.m. on Monday.

A complete series of model rockets, a model of the lunar surface, space suits, future spacecraft and a telemetry apparatus will be available during each session for the public to view.

Houston Museum of Natural Science is located at 5800 Caroline Street in Herman Park.



SKYLAB 3 TRAINING—Astronaut Alan L. Bean, commander of the second manned Skylab mission (Skylab 3) participated in preflight training at JSC. Bean was standing in the Airlock Module trainer in the Mission Training and Simulation Facility, Building 5, at JSC. He was looking at a photograph which simulated what he would see looking out toward the Apollo Telescope Mount.



IN MDA—The three prime crewmen of SL3 trained in the MDA at JSC. Left to right are Owen K. Garriot, science-pilot; Alan L. Bean, commander; and Jack R. Lousma, pilot. Assisting with the training was Astronaut Russell L. Schweickart (on right). Another training officer is seen in the left background.

Four Teams Place In Tournament

The "Coffee Time Brewers" captured first place in the "Moonwalk Slow Pitch Softball Tourney" held at JSC July 21-22. The "Brewer's" Harold Bordier was named Most Valuable Player (MVP) in the tournament.

The "Ed Smith Ford" team whose outstanding player was shortstop Ken McCormic, came in second.

Third place went to "Cinema West." Their outstanding player was rightfielder Prince Williams.

"Miller Freeman Ford" came in fourth. Their outstanding player was pitcher-outfielder Al Morrey.

All four teams and their most outstanding players received trophies which were donated by the Space Center Memorial Hospital.



JSC-EAA

ALL STAR PICNIC
SATURDAY, SEPTEMBER 8, 1973
CAMP MANISON - FRIENDSWOOD, TEXAS



Barbara Jordan

(Continued From Page 2)

amously elected President Pro Tempore.

In 1972, Miss Jordan was elected United States Representative from Houston's District 18.

Among many honors, Miss Jordan was selected by UPI as one of the top 10 most influential women in Texas and was named in Harpers Bazaar Magazine as one of the "100 Women in Touch With Our Time."

Miss Jordan will speak to approximately 104 students employed by JSC. These students, aged 16-21, are spending the summer working at a variety of jobs within JSC before returning to school in the fall.

The purpose of the Summer Aid Program is to provide meaningful employment experiences and to give participants an opportunity to learn more about government employment.

Some of the Aids have spent as many as four consecutive summers at the Center and are valuable in relieving clerical shortages.

Many of the Summer Aids will receive awards for outstanding accomplishments at the Annual Awards Luncheon.

Skylab 3

(Continued From Page 1)

Another experiment which requires little astronaut participation is SO-15 zero gravity single human cells. This biological experiment located in the CM hopefully will provide answers to the questions—will Zero gravity affect aging, will the lack of gravity alter man's genetic makeup.

The object of the spider experiment involving lady spider "Arabella" and possibly "Anita", is to see what kind of web the spiders spin in weightlessness.

Another experiment using "Mummichog minnows" examines the disorientation of fish when exposed to weightlessness.



SOLAR FLARE—This photograph of the significant solar flare of the Skylab 2 mission is reproduced from one of the frames of flight film recovered from the Hydrogen Alpha Telescope No. 1. There are two H α telescopes on ATM which are used by the astronauts to guide the main ultraviolet and X-ray telescopes to precise targets on the sun. One of these telescopes (#1) provides a photographic record of the solar disc at the exact times of ATM experiments for later data analysis. Both telescopes provide TV displays of the sun to the astronauts on board Skylab. Both telescopes have zoom capability from approximately full sun images to a field of view of 4.5 arc min. The cross hairs are accurately aligned to the HCO and NRL instruments by the astronaut using the sharp limb of the sun, and indicate where those instruments were located during the flare data taking sequences.

ASTP Mission

(Continued From Page 1)

and in March 1975. Duration of training sessions will be agreed upon after the astronaut familiarization visit to the USSR. The training plan is expected to be completed at that time, and all flight procedures are expected to be finalized by the end of 1974.

—The final selection of joint experiments will be in October, 1973.

—Reports will be exchanged on an assessment of the safety of the flight based upon tests performed in the course of man-

ufacturing and checkout in preparation for the flight.

The U.S.S.R. side stated that the Moscow Center of Control of Manned Space Flight near Moscow will be used by the U.S.S.R., and Cosmonaut Aleksey S. Yeliseyev will be the flight director for the Soviet Union.

The U. S. technical director and several of the working groups will attend meetings in the Soviet Union in October, 1973.

NASA Board Reports on Skylab I Shield Failure

The Skylab investigation board appointed by NASA has reported that the most probable cause of the meteoroid shield system failure during the May 14 Skylab launch was inadequate venting of the pressure in a tunnel under the shield.

The differential pressure buildup in the tunnel, as the vehicle rose through the atmosphere, acted to force the forward end of the shield away from the shell of the workshop and into the supersonic air stream.

When the meteoroid shield was torn loose by the supersonic streams it broke the tie-downs which held one of the two solar array systems on the Skylab Workshop.

Later—about 10 minutes into the flight—the solar array "wing" was completely torn away when it was struck by the

exhaust plume of the second-stage retro-rockets.

Successful operation of the workshop was jeopardized for a time when the remaining solar array would not deploy. A metal strap from the meteoroid shield still attached to the workshop had curled around the wing and penetrated the metal fairing which housed the array.

The mission was saved, however, when Astronauts Charles (Pete) Conrad and Joseph Kerwin, acting on the basis of information developed by hundreds of NASA and contractor personnel on the ground, cut the strap on June 7.

The solar array system was deployed, providing enough power to complete all scientific and technical objectives in a highly successful first manned Skylab mission.

Rate Gyro Pack

(Continued From Page 1)

The RGP's that would be replaced are installed in several locations on the ATM rack, generally inaccessible to EVA operations. The replacement procedure, should it be called into play, calls for the astronauts to mount the new rate gyro augmentation package on the inside of the craft—one a bulkhead in the Multiple Docking Adapter.

A cable would lead from the package through an existing conduit in the wall of the space station to the outside. On the outside, cable connections must be made in order to send the RGP's output signals to the computer interface unit located on the ATM.

Replacement of the RGP's, therefore, would call for an EVA. It would be a relatively easy operation, however, one that required only twenty minutes in underwater simulation by an astronaut at the

Marshall Space Flight Center.

The total equipment carried to orbit to provide this insurance weighs about 145 pounds. It was prepared along with installation procedures at the Marshall Flight Center.

If three units in one axis were lost, it was planned (before the problem of second quad engine on CSM developed) for the CSM to be activated by the crew to provide space station stability through the use of its attitude control system.

Should the change be made, the six units sent on this flight could be used in concert with three of the original units—one in each axis—to provide the normal number of nine functioning gyros.

The overheating in the gyros now installed is believed to be due to a malfunction in the late gyro heater circuit.



PI FOR MO73 EXPERIMENT—Dr. Carolyn Huntoon, Principal Investigator for SL Experiment MO73 explains the experiment to other SL Principal Investigators who had gathered to analyze data from SL2 experiments.



RECEIVING AWARDS—In order to stimulate interest in the Small Business Set-Aside Program, JSC's Procurement Organization awarded certificates for outstanding performance at the 2nd annual Awards Presentation to Ruth L. Wood and Jerry Haptonstall. Procurement officer James Neal (left) presented the awards. Looking on is H. T. "Chris" Christman (far right) the Center's Small Business Specialist.