

ROUNDUP

Lyndon B. Johnson
Space Center

NASA

March 31, 1978 Houston, Texas

Vol. 17 No. 6



NEW ASTRONAUT CREWS ARE VETERANS — Shown here are (left to right) Donald K. Slayton, OFT Manager, with newly named Shuttle crewmen Vance D. Brand, Jack R. Lousma, and John W. Young.



ALT ASTRONAUTS ARE SHUTTLE PRIMARY AND BACKUP CREWS — Members of the two crews for the ALT missions are shown (left to right) prior to the start of a press conference conducted Apr. 5, 1977: Joe H. Engle, Richard H. Truly, C. Gordon Fullerton, and Fred W. Haise, Jr.

Enterprise goes to MSFC for ground vibration tests

The Space Shuttle Orbiter *Enterprise*, riding atop its 747 carrier aircraft, arrived in Alabama Monday morning, March 13. It was greeted by an estimated 6,000 to 7,000 people including Marshall Space Flight Center employees, invited guests,

and media representatives.

At the Marshall Center, the Orbiter will be joined by other major Shuttle components, the external tank and the solid rocket boosters, for a series of ground vibration tests lasting several months.



ENTERPRISE REMOVED FROM FERRY POSITION — Tuesday night, Mar. 14, the *Enterprise* was removed from atop the 747 and transported past the Marshall Center Headquarters complex the next day. It was placed in a hangar-type building where it will be prepared for the series of ground vibration tests.

Flight crews selected for early Shuttle training

Four two-man crews have been selected to begin training for early orbital flights of the Space Shuttle. They are: John W. Young, 47, commander and Robert L. Crippen, 40, pilot; Joe H. Engle, 45, commander and Richard H. Truly, 40, pilot; Fred W. Haise, 45, commander and Jack R. Lousma, 42, pilot; Vance D. Brand, 46, commander and Charles G. Fullerton, 41, pilot.

Young and Crippen will be the prime flight crew for the first orbital flight test (OFT-1) scheduled for launch from the Kennedy Space Center in the spring of 1979. Engle and Truly will be their back-up crew.

Flight assignments for the others named will be made at a later date.

NASA plans a series of six orbital flight tests, each of increasing complexity, to check out the nation's first reusable spacecraft. On the first four flights, the 75-ton orbiter will return from space to an unpowered landing on a dry lakebed at Edwards Air Force Base, California. Thereafter, the spacecraft will return to a specially constructed runway at its Cape Canaveral launch site.

The space agency is currently considering a mission to boost Skylab into a higher orbit during one of the OFT flights. If the decision is made to implement that plan, prime and backup flight crews will be selected from those named.

On the first four flights, the 75-ton orbiter will return from space to an unpowered landing on a dry lakebed at Edwards Air Force Base, California. Thereafter, the spacecraft will return to a specially constructed runway at its Cape Canaveral launch site.

The Skylab reboost mission will be fairly complex, newsmen were told. Haise said that after rendezvousing and docking with Skylab, a two-burn maneuver would be required to boost Skylab about 70 nautical miles above the orbit it will be in when the mission is flown. He stated that the teleoperator will be put in a storage mode after the reboost maneuvers and would be retrieved on a later mission.

A reporter referred to John Young as "sort of the granddaddy of spaceflight" and asked him how he felt about the anticipation and feeling concerning his first Shuttle flight compared to others he had flown. (Young has two Gemini and two Apollo flights to his credit.)

After the laughter subsided over his having been referred to as the granddaddy, Young responded that the Shuttle is an "absolutely revolutionary flying machine." He said Shuttle will do things for spaceflight that will change the world and change aviation in ways that presently in aviation cannot imagine.

"The first mission will be very exciting for all of us to work on and participate in," Young stated.



HE'S USED TO BEING MANEUVERED — Newly selected Shuttle astronaut Robert L. Crippen is shown here taking part in training for orbital workshop. He is in the Space Operations Simulator where maneuvering inputs are commanded by the test subject's use of the hand controller.

Three Flight Directors are named at JSC

Flight directors for the first manned Shuttle orbital flight have been named by NASA at JSC.

The new flight directors are Neil B. Hutchinson, Charles B. Lewis, and Donald R. Puddy, all of the JSC Flight Operations Directorate. They will be responsible for planning and directing the activities of the Mission Control Center during Shuttle real-time mission operations.

Their responsibilities will include the integration of inputs from all elements of NASA, contractor and the scientific communities.

Hutchinson will be responsible for planning and directing all activities associated with the Shuttle ascent phase, Lewis the on-orbit phase, and Puddy the entry phase of the Orbiter.

Hutchinson, Lewis and Puddy were flight directors during Apollo and Skylab missions.



SHUTTLE FLIGHT DIRECTORS — Here are newly selected Shuttle Flight Directors (left to right) Charles R. Lewis, Donald R. Puddy, and Neil B. Hutchinson as they appeared in Nov. 1971 when they were named deputy flight directors for NASA's Apollo Program.

Ivy Hooks gets Flemming Award

Ivy Fay Hooks, who recently became manager for the JSC Level 6 Verification Testing, Spacecraft Software Division, Data Systems and Analysis Directorate, was presented the coveted Arthur S. Flemming Award March 23 in Washington, D.C.

This award is presented annually to ten outstanding young men and women in Federal Government.

Hooks received the award for her overall engineering contributions in her specialty areas, which have recently and in particular included her detailed analyses and management of the integration of engineering activities leading to the planning, development, and verification of the orbiter/carrier separation systems for the Shuttle Approach and Landing Test (ALT) flights. She was able, through her technical and managerial expertise, to reduce testing time and program costs in her area — a valuable contribution to the entire Shuttle Program.

Another outstanding example of her technical ability involved the design of the Shuttle solid rocket booster separation system. Concerned that particles from the solid separation motors as proposed by the contractor might cause damage when they impinged on the orbiter's thermal protection system, she proposed a series of in-house tests to determine whether or not a problem existed. The tests were performed and the results verified her concerns. Consequently, the motor characteristics and locations were changed and the problem eliminated. Another problem in the Shuttle development involved the external tank separation. Based on studies performed under her leadership, it was determined that a reaction control system could be used to achieve separation, and as a result, a solid motor in the Shuttle external tank nose was eliminated.

In early 1969, Hooks was selected to be a member of the original team of engineers chosen to accomplish the preliminary design of the Space Shuttle system. She worked across many disciplines during the Shuttle design phase but her major activity involved separation systems because of her expertise in spacecraft flight dynamics. By the early 1970's, Hooks was recognized within NASA and in the aerospace community as an expert in aerodynamics and flight dynamics, and when the Space Shuttle Program Office was formed, she was selected to serve as the Shuttle Separation Systems Integration Manager. It was in this capacity that she became responsible for assuring the various complex Shuttle separation subsystems (solid rocket booster, external tank, and carrier)

were able to meet their functional and interface requirements.

Hooks has been seriously involved in several community activities. She is currently serving her second term as President, Texas Section, Society of Women Engineers.

Hooks is a member of the Clear Lake Area American Business Women's Association and has served on the staff of the organization's monthly publication.

Among Hook's many awards are the JSC Superior Achievement Award in 1976, three Group Achievement Awards: NASA ASTP Operations Team (1975), NASA Skylab Program (1974), and JSC Space Shuttle Program Definition and Preliminary Design Team (1972).

Her professional affiliations include the Mathematical Society of America, Sigma Pi Sigma (Honorary Physics Society), the American Institute of Aeronautics and Astronautics, and the two women's professional organizations already mentioned.

Hooks joined JSC (formerly the Manned Spacecraft Center) as an aerospace engineer in 1963 shortly after she received a bachelor of science degree in mathematics from the University of Houston. As a trainee engineer, she was assigned to the Spacecraft Technology Division where she worked on lunar lighting simulations for the manned lunar landings. Because of her initial accomplishments, she was selected by the Center to continue her education on a full time basis at the University of Houston, and in 1965 she was awarded a Master of Science degree in mathematics. In 1966, Hooks was given the assignment to conduct studies on the dynamics of the Apollo spacecraft launch escape system with the additional responsibility of predicting the effect of jet plumes from the Apollo propulsion systems on space vehicles, men in space, and satellites. As the Apollo Program moved into more operational phases, she became significantly involved in the aerodynamic analyses of Apollo flight systems.



Ivy Hooks



SPECIAL ACHIEVEMENT AWARD RECIPIENTS — The recipients of the JSC Special Achievement Awards are shown above, with the exception of Dr. Robert A. Parker and Dr. Eddie H. Harris, who were unable to attend the ceremony. Center Director Christopher Kraft is shown on the far left, and Sigurd A. Sjoberg is the man on the far right.

Special Achievement Awards go to Astronaut Selection Board

Twenty-four JSC employees were presented the JSC Special Achievement Award March 10 by Center Director Christopher Kraft for their significant contributions to the success of the Astronaut Candidate Selection Program.

The first recipient was George W. S. Abbey, Chairman of the Astronaut Selection Board. The award was an official recognition of his managerial leadership.

In recognition of their outstanding achievements as members of the Astronaut Selection Board, the following individuals were presented the award: Joseph D. Atkinson, Jr.; Carolyn L. Huntoon; Joseph P. Kerwin; Edward G. Gibson; Robert A. Parker; James H. Trainor; Vance D. Brand; John W. Young; Martin L. Raines; and Robert O. Piland.

Jay F. Honeycutt was similarly recognized for his exceptional performance during the selection program, and Duane L. Ross was presented the award for his leadership in establishing and managing the Astronaut Recruiting Office.

Lawrence F. Dietlein, M.D. was cited for his leadership as Chairman of the Space Medicine Board during the selec-

tion program, while Sam L. Pool, M.D. was recognized for his management of the medical qualification program for the astronaut selection process. Eddie H. Harris, M.D. was presented the award for his outstanding achievements in evaluating the candidates, and Stuart A. Bergman, Jr., M.D. was recognized for his achievements as Chief Examining Physician.

Dedicated service and exceptional work in the Astronaut Recruiting Office earned Joan C. Whitney, Glenda I. Warren, Ruth A. Hollen, and Betty A. Kuliniwicz the Special Achievement Award.

The protocol and transportation support to candidates was recognized in the award to Edward S. Barker, and Bert I. Smith was selected for the award for his achievements in providing personnel security coordination.

H. Cheryl Bouillion, a former outstanding secretary award recipient, was recognized for her outstanding support of the Astronaut Selection Board and exceptional work, and Jack R. Lister was officially recognized for his personnel management leadership during the selection program.

Nancy Fee is top March secretary

"Without diminishing the value of others in the Branch, it is the good secretary at the 'hub' of things which makes it roll smoothly," declared Rudolf A. Hoffman, Chief, Experiments Definition and Special Projects Branch, who nominated his secretary, Nancy L. Fee, for an Outstanding Secretary Award.

"She performs routine duties that one might expect from any secretary with particular intelligence, efficiency, speed, and enthusiasm. She gets things done," Hoffman continues.

Fee's tenure at JSC spans the Apollo, Skylab, and ASTP programs, and she was extensively involved in various aspects of each — from the Lunar Quarantine Program to the development of experiments for each of the above missions.

Because of her excellent reputation in the handling of paper work, Fee was able and willing to assist one of the 11 Branch members with a very complex, non-routine, crash-type task; namely, the four-month preparation of a 197-page report on the biological effects of stratospheric ozone reduction/increased solar ultraviolet radiation. The report was submitted to the U.S. Environmental Protection Agency (EPA) and was used by them and the U.S. Food and Drug Administration in their support documents for regulation of chloro-fluorocarbon use in aerosol cans.

Fee's support in this task involved mastering the use of an automatic word processor machine with only two hours of instruction — sans machine — as opposed to the recommended one-day on-the-job training period; accurately typing numerous drafts of the manuscript from

garbled, almost illegible cut and patched roughs having a number of equations; and laying out extensive tables attractively.

For her part in this report preparation, Fee received a statement of great appreciation from the EPA — and a bouquet of flowers!

In addition to her secretarial duties, Fee serves as an Equal Employment Opportunity counselor and a union steward and has performed these tasks efficiently without compromising her secretarial work.

In recognition of Fee's long-standing excellence in the performance of her secretarial duties at JSC, she was selected for the Outstanding Secretary Award and presented a \$100 check by Center Director Christopher Kraft.



Nancy Fee

What's cookin' in the JSC cafeteria

WEEK OF APRIL 3 - 7

MONDAY: Cream of Celery Soup; Braised Beef Ribs; Chicken a la King; Enchiladas w/chili; Italian Cutlet (Special); Brussel Sprouts, Navy Beans. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

TUESDAY: Beef & Barley Soup; Turkey & Dressing; Country Style Steak; Beef Ravioli; Stuffed Cabbage (Special); Corn Cobette, Okra & Tomatoes, French Beans.

WEDNESDAY: Seafood Gumbo; Catfish w/Hush Puppies; Roast Pork w/Dressing; 8-oz. T-Bone Steak; BBQ Plate; Chinese Pepper Steak (Special); Broccoli, Macaroni w/Cheese, Stewed Tomatoes.

THURSDAY: Cream of Tomato Soup; Beef Tacos; BBQ Ham Slice; Hungarian Goulash; Chicken Fried Steak (Special); Spinach, Pinto Beans, Beets.

FRIDAY: Seafood Gumbo; Liver w/Onions; Deviled Crabs; Roast Beef w/Dressing; Seafood Platter; Tuna & Noodle Casserole (Special); Whipped Potatoes, Peas, Cauliflower.

WEEK OF APRIL 10 - 14

MONDAY: French Onion Soup; Beef Chop Suey; Polish Sausage; German Potato Salad; Breaded Veal Cutlet (Special); Okra & Tomato, Green Peas. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches, and Pies.

TUESDAY: Split Pea Soup; Shrimp Creole; Salisbury Steak; 8-oz. T-Bone Steak; Fried Chicken (Special); Mixed Vegetables, Beets.

WEDNESDAY: Vegetable Soup; Fried Catfish w/Hush Puppies; Braised Beef Ribs; BBQ Plate; Weiners & Beans; Shrimp Salad; Stuffed Bell Pepper (Special); Corn O'Brien, Italian Green Beans, Rice.

THURSDAY: Chicken Noodle Soup; Beef Stroganoff; Turkey & Dressing; BBQ Smoked Link (Special); Lima Beans, Buttered Squash, Spanish Rice.

FRIDAY: Seafood Gumbo; Broiled Flounder; Liver w/Onions; Seafood Platter; Fried Shrimp; Meat Sauce & Spaghetti (Special); Green Beans, Buttered Broccoli, Whipped Potato.

Special Announcements

PARK CAMPSITES

If you're planning to camp overnight in one of sixteen selected state parks this year, you might wish to reserve a campsite by mail, telephone or in person, according to the Texas Parks and Wildlife Department. In the past, only cabins, shelters and group facilities could be reserved. Overnight camping is now regulated in most state parks to the extent that each site is numbered and clearly defined, making it necessary to turn campers away after all sites have been filled. In order to avoid persons traveling long distances only to find that all campsites are taken, the department placed sixteen of the more popular parks on a campsite reservation system.

A list of parks where campsites can be reserved are available from the *Roundup* editor.

For additional information on state parks and their camping facilities, write Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744.

SPACE COLONIZATION SEMINAR

Today, Friday March 31, at 4:00 p.m. in the Berkner Room of the Lunar and Planetary Institute (3303 NASA Road 1), Professor Thomas A. Heppenheimer of the Max Planck Institute, Heidelberg, Germany, will lecture on "The Problem of Lunar Mass Transport in Space Colonization". Professor Heppenheimer, an expert in the field of aerospace engineering, is the author of the very popular book

Colonies in Space, and is vitally interested in both the technical and philosophical aspects of space colonization.

COMING EVENT

JSC will commemorate the 10th Anniversary of the Federal Women's Program with a week-long observance April 17-21. See next issue of *Roundup* for complete details of planned activities.

Gilruth Recreation Classes

OIL PAINTING — The beginning oil painting class scheduled to begin on March 16 has been postponed until April 6. The classes will be held on April 6, 13, 20, 27, May 4, and 11. All classes are on Thursday night, 6-8 p.m., room 209, Gilruth Recreation Center.

This will be the last class until the next one scheduled to start in September. In the event there is a large enough demand for a summer class, the request will be considered and dates established. Those interested must contact Ted MacDonald or Tim Kincaid at the Gilruth Recreation Center, X-3594 or X-4921, or the instructor, Lois Miller, X-3216, as soon as possible, for the April 6 class as well as the possible summer session. If there is not a minimum registration of 8 students per class, the classes will be cancelled.

MICROWAVE COOKERY - Do you own one of those expensive microwave ovens but don't really know how to use it? Here's the class for you. Four 2 1/2-hr. demonstration and tasting classes, covering basic microwave techniques for cooking appetizers, candy, desserts, eggs, fish, main dishes, meat, pies,

EAA Attractions

DEAN GOSS DINNER THEATER

Dean Goss Dinner Theater tickets are no longer sold at the Bldg. 11 Exchange Store. Get the tickets from Jim McBride, Bldg. 4, Rm. 130. Couples are \$16; singles \$8. Tickets are good any night except Saturday.

HOUSTON AERO HOCKEY

Remember the upcoming home games with Winnipeg Apr. 4 and Cincinnati Apr. 8 (the final game of the season). Then look for the playoffs.

RESTAURANT / THEATER CLUB

The Restaurant and Theater Club has come out with a new plan and price. Memberships are now for six months from the date of purchase instead of 12 months. The cost is \$10.50 instead of \$22.50. The club offers two-for-the-price-of-one dinners/admissions to most dinner theaters in Houston; some good restaurants, Alley Theater, the Houston Symphony, Theater Under the Stars, and other theaters plus travel packages. EAA reps will have new envelopes about Apr. 1.

SIX FLAGS OVER TEXAS

Six Flags Over Texas tickets are now available at the Bldg. 11 Exchange Store for \$6.75. The regular price is \$8.50. Also, the HGAIRC is sponsoring a weekend excursion to Six Flags Apr. 8 & 9 for all JSC employees. Deadline for reservations is Mar. 22. Call Tim Kincaid, X-3594 for further information after 2 p.m.

DISNEYLAND & DISNEYWORLD

Magic Kingdom cards for Disneyland and Disneyworld are also available free in the Exchange Store. The cards are good for ride ticket discounts at the parks and lodging discounts at some motel chains.

PICNIC HAS THEME

"Close Encounters of the Fun Kind" is the theme selected for the 1978 EAA Picnic. The picnic committee is trying to get that old feeling back into the picnic by planning games and contests — all for fun — that everyone can participate in. Remember May 6 at Camp Manison. Adults, \$3; children, \$2.50.

COMING EVENTS

Watch for: Nostalgia Dance, Music of the 50's; Soul Dance!

Roundup Swap Shop

CARS & TRUCKS

68 Corvette Convertible. White, 2 tops, A/C, auto, pwr, AM-FM, xint cond. \$3,950. Curlee, X-4269 or 649-0011.

77 Honda Civic. Red, 5-spd, 8500 mi, under warranty, A/C, AM radio, radials, 30-35 mpg, like new. \$3,850. Ward, X-4976.

70 Ford van. Xint cond, A/C, auto, 4 steel-belted radials, capt chairs. 488-4890 after 5.

71 Buick LeSabre. Custom, 4-dr, loaded, pwr seats & windows, xint cond, low mi. \$1,350. 333-2509.

72 Galaxy Ford. Sedan, 4-dr, A/C, pwr steer & brakes, radio, 60K mi, orig owner, xint cond. \$1,250. 683-9239 after 6 weekdays.

73 Chevy Cheyenne 1/2-ton Pickup. Loaded w/ camper cover, 454. \$2,000. 946-3497.

76 Triumph. TR-7. Carmine red/silver striping, AM-FM stereo, luggage rack, low mi, xint cond. \$4,900. 641-1586 after 5.

75 Camaro - LT. Auto, 350, A/C, stereo, tilt, pwr windows, door locks. Ellis, X-3048 or 466-5127.

75 Chevrolet Caprice. AM-FM radio, pwr windows & seat, A/C, vinyl top, good tires. \$3,000. Starnes, X-3763 or 337-2816 after 5:30.

75 Impala. AM-FM stereo tape, 4-dr, full equip, 45K mi, xint cond. \$2,150. Marks, X-2693 or 488-3354.

74 Ford Maverick. A/C, pwr, auto, 4-dr, 36K mi, xint cond. \$1,950. 482-7029.

75 Honda CVCC. Yellow, 2-dr, 5-sp, A/C, 28K mi, very clean. \$2,800. 332-1251 or 554-6006.

77 Plymouth Volare. Custom, auto, 4-dr, pwr, factory warranty. \$3,995. 466-5127.

BOATS

Ski boat. Carlson Charger W/160 HP Mercruiser Six I/O, 17 1/2 ft, power trim, access, Wallstrong trailer. Hudson, 488-5789 after 5.

74 Larson 1650 Shark S.E. (trihull bowrider). '75 115 HP Johnson, Sportsman trailer, low usage, xint ski/fish boat. \$2,900. Stanley, X-6181 or 488-5881.

Venture 24' Sailboat. Fully equipped, xint cond, sleeps 5, galley, head, pop-top, retractable keel, life lines, carpet, sail cover 10 HP Mercury, slip available. 334-2694 or 474-4885.

CYCLES

71 Kawasaki 175cc. Won't run, but has new tag. As is: \$50. Crawford, 481-6263.

74 Honda XR 75 trail bike. Good cond. \$350. McCollum, 488-4696.

HOUSEHOLD ARTICLES

Bureau. 52" long, 23" wide. \$25. 333-4669. Microwave oven. Litton Model 540MB, top-of-the-line, still in sealed carton, sells f/ \$629.95. Will sell f/ \$479. 333-4655.

Four-cushion couch. Blue & white, xint cond, \$100. Also small couch, \$20; table \$10. Griffin, 482-9238 Sat. only.

Nutone exhaust hood. Non-conduct type w/ filter f/ over range. Stainless steel finish, 36" wide. \$60. Eggleston, 482-4239.

Wrought iron dining table & 4 chairs, \$125. Also, 19" port color TV, \$100. 333-3425 after 6.

PROPERTY & RENTALS

Sale: Sagemont, 3-2-2, both formals, den, covered deck, built-in breakfast area, fenced, near schools. \$47,500. Appt. only; no agents. Owner, 481-3968.

Lease: Wedgewood, exceptional 3-2-2 w/ fireplace, formal, fenced back yard. Near JSC & new Baybrook Shopping Center. \$390/mo plus dep. Jeff, X-3856 or 482-5393.

Lease: CLC, new Baywind Condo. Fireplace, refig, drapes, private patio, 2 bdms, pool, sauna, clubhouse. 334-2461.

Sale: Large wooded lot in big thicket area. Access to fishing lake. Leach, X-3584 or 474-3386.

Rent: Bolivar Beach Cottage. Surfing, xint fishing at your front door, wood-burning fireplace. Families only. \$35/day; \$60/wkend; \$200/wk. Horton, X-3734.

Sale: Two adjoining lake lots, Lake Bonanza near Lake Conroe. Subdivision offers clubhouse, pools, golf course, tennis courts. Price negotiable. Martin, 721-1226.

Rent: 1-bdrm condo. Access to pool, sauna, clubhouse; 2 patios, downstairs. \$250/mo plus elec. Monica, 334-5289.

Sale: Wooded golf course lot at Hilltop Lakes Resort. \$8,500. 334-3393 after 6.

Rent: Lakeside vacation retreat at Cape Royale on Lake Livingston. Tennis, fishing, boat launch, golf. 488-3746.

Rent: Lake Livingston, Cape Royale, compl furn home, 3-2-1. Fishing, hunting, tennis, golf, etc. Reserve early. Wk/mo/yr rates. 488-4487.

Rent: Galveston West End. 2 BR by-the-sea condo apt. full furn. \$180/wk off-season; \$260/wk in-season. Clements, 474-2622.

Rent: New Galveston Island Jamaica Beach cottage. \$175/wk or \$30/day for weekends. 334-1640 after 6 p.m.

Sale: Beautifully wooded homesite at Columbia Lakes. Big lot on cul-de-sac. Year-round living w/ compl rec facilities. \$11,500. Heyer, 488-2691 after 6.

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be about 20 words and include home phone number. Typed or printed ad copy must be received by AP3/Roundup by Wednesday of the week prior to publication.

Sale: 12, 25, or 75 acres; 4-hr drive. \$600/acre. Property uses: current income, investment, homesite, limited rec. Burton, 481-0780 after 5.

Sale: Caney Creek waterfront lot. Access to canal, creek, Gulf; near Sargent, Tex. \$350. 946-8695 or 921-7212.

STEREOS & CAMERAS

Tandberg 64. Three-head, 3-sp open reel tape deck, xint cond; complete w/ access, extra tape, etc. \$120 488-3966.

Stereo equipment: Realistic STA-65C AM-FM receiver, 42 watts RMS, \$65. Also, BSR510 turntable, Shure cartridge, \$45. Both f/ \$100. 488-5037.

AIWA Cassette tape recorder, good cond, mike, earphone, AC battery op., \$20 or offer. Also, two 12" unmounted speakers; freq. response: 150 to 14500 Hz., \$25 or offer. Stencil, X-6467 or 334-4707.

MUSICAL INSTRUMENTS

Reed organ. Sears Model 257, double keyboard, chords, rhythm tabs, voices, w/ bench. \$200. Also, violin. Chin rest, 3/4-size roth, bow, case. \$300. Coen, 488-8286.

Guitar. Ovation acoustic, 12-string, perfect cond. 488-2613.

Cello. Full size, fine quality. \$2,000. Also, full-size practical cello, \$200. Bates, X-4601 or 944-4687 after 5:30.

WANTED

Need ride or rider f/ carpool: Edgebrook & Old Galveston Rd. area. 7:30-4. Gardner, X-4721 or 944-5615 after 5.

Will pay up to \$125 f/ good used 10" table saw. Burton, X-2568.

Need paint sprayer/compressor unit. 474-2081.

Need rider and/or driver f/ carpool from Baytown. 8-4:30. Brenda, X-3479 or 573-1449.

Firefighters needed! Men and women adult residents of CLC needed to join CLC Volunteer Fire Dept. Rewarding community service. You will be trained and equipped. Call 488-0023 any time.

Need new members f/ Bacliff Bass Club. Singles-couples welcome. Meetings, tournaments, prizes. Parker, X-4241 or Mobley, X-4428.

Need rides for carpool from W Loop, SW Fwy. Bellaire area, 8-4:30. McLaughlin, X-5536 or 661-2974.

PETS

Labrador Retriever pups. AKC, black & chocolate, shots & wormed. \$150. 331-3016.

MISCELLANEOUS

Black van seats. Deluxe foam w/ base & adjustment, new cond. Both f/ \$70. 643-4002.

Eight HP ride-on lawnmower. Xint cond. Klotz, 488-1514.

Challenger no. 5350 plastic gun case f/ 2 scoped rifles. Never used. Cost \$53.25; will take \$45. 944-5615 after 5.

Dark grey men's bowling shoes. Size 9, worn once. Cost \$16; will take \$10. 333-3506 after 5.

White wedding gown & veil seen in "Modern Brides." New, \$400; will sell f/ \$200 or best offer. Linda, 644-7824.

Margay racing Go-Kart. Mac engines, many spares, money winner. Siler, 333-2787.

Two good used G60 X 15 XT-120 tires. Four-ply, tubeless. Both f/ \$20. 482-7546.

Car hauling trailer. Tandem axel, 14', lights, fenders, ramps. \$350. Also, mag wheels w/ wide tires (G.M.) 2 F60 X 14; 2 D70 X 14. Two tires will pass inspection. \$65 or will trade f/ stock Chevy wheels & tires E or F size. Also, headers f/ small black Chevy, very little use, includes one thrush muffler. \$25. 554-6685.

Four Champion N9Y spark plugs f/ \$.50 ea. Kosel, X-6421 or 534-6098.

Coins: 1977 BU dollar & half-dollar marks. X-2693 or 488-3354.

Camper top f/ pickup. Movable windows, dome lights, paneled inside, f/ approx. 6 X 8 ft. bed. \$200 or best offer. Wells, X-3851 or 554-6056.

Tent trailer. Sleeps 6, propane stove, heater; 1969 Travelmate in good cond. \$800. 334-3393 after 6.

Two mud/snow tires. G70-14, 4-ply nylon. \$10 ea. Readiger, 479-2979.

K&E 6" slide rule. Log rule Duplex Decitrig no. 4181C, mint cond w/ leather sheath in box w/ manual, \$10. Also office desk, like new, 60" X 30" Formica top, 4-box, file, top drawer, \$75. And, Koneig side packs f/ pickup truck, bolt-on type, good cond. Cost \$600 new. Sell f/ \$300 or best offer. 921-7212 (or 772-5410, last item).

LOST & FOUND

Found: Ladies watch. Call Carol, X-3116.

ROUNDUP

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: Beverly Eakman
Photographer: A. "Pat" Patnesky

Glaser, Moyer captivate Energy Conference audience

If you missed the second session of the two-day conference on energy held here March 23, you not only missed a most informative and understandable series of lectures on the subject, but an impressive array of energy experts as well; in particular, Dr. Peter E. Glaser, who is commonly thought of as the initiator of the solar power satellite concept.

The conference, entitled "Meeting Our Energy Needs Today and Tomorrow," was sponsored by the University of Houston at Clear Lake, The Energy Institute-University of Houston, and the National Consumer Research Institute. The lectures summarized the results of studies to date on the solar power satellite system and included an in-depth discussion about the concept and its related technologies, environmental factors, natural resources, possible international and institutional implications, and financial considerations.

Dr. James W. Moyer of the Southern California Edison Research Staff was certainly one of the most entertaining speakers. His experience ranges from work on the Manhattan Project to solid-state physics to a director of applied research. His presence at this conference — and his enthusiastic support of solar satellite power — made him very important for the reason he represented one of the five largest utility companies in the United States and claimed that he and many others in the utility companies were quite enthusiastic about the project and wanted urgently "to get on with it."

Dr. John W. Freeman from the Rice University solar power satellite program (of which he is manager) chaired the session. The agenda was divided into two parts, ground-based solar power, which was covered in a very well-presented lecture by Dr. A. F. Hildebrandt of the University of Houston, and the solar power satellite, which was detailed in five lectures. A question-answer panel discussion followed.

Hildebrandt was a pioneer in what is known as the solar power tower concept.

The power tower simulates a parabolic collector of solar energy. It is a point-focused device on a large scale and utilizes heliostats (or mirrors) to direct and concentrate solar energy.

However, as with many other ground-based solar energy concepts, among them photovoltaic (solar cells or "direct conversion techniques"), wind technology, and others, this solar thermal concept requires a sophisticated storage method if more than six or ten hours of energy can be expected from it. Several methods of doing this have been devised, says Hildebrandt; among them deep caverns of storing hot oil, rock and oil storage concepts being explored by Rockwell International, McDonnell Douglas and others.

Hildebrandt noted that the ocean thermal concept and the solar power satellite concept did not require special storage procedures.

Nevertheless, the power tower ground-based scheme of producing electrical energy (with the usual inefficiency factor of one-third) was given a net energy factor of 20 for a 30-year plant life as compared to earlier published figures for nuclear plants — showing a net energy factor of four.

Glaser headed the list of solar power satellite speakers. Since 1955 he has been involved in considerable solar energy research. He was responsible also for three instruments that were deployed on the lunar surface by the Apollo astronauts.

Glaser first proposed the solar power satellite concept in 1968, when people were not concerned with an energy shortage. Slowly, he said, the scientific community is becoming aware that solar energy "shines brighter than ever as the major energy source."

He went on from there to relate the relative advantages of collection of solar energy in space, "where it is available all the time," as opposed to the disadvantages of any terrestrial energy concept. Advantages include the absence of gravity and weather, the avoidance of thermal pollution and waste, and the ability to direct a beam of collected energy to any location on Earth, whether the locality is sunny or not, has usable land or not, or is close to the user or not.

Everything concerning this concept, he noted, depends upon the development of the Space Shuttle, and he believes the idea is becoming economically attractive and socially acceptable.

Microwave beams and laser beams have been considered to transmit this energy to Earth. Already, Glaser says, man has demonstrated the ability to direct a microwave beam very accurately. A spacecraft beamed educational television programs by microwave to India from orbit.

As for safety, Glaser indicated that one cannot concentrate microwaves into a weapon system, while lasers can be lethal, so all nations would have to agree on any use of the laser method to ensure that it would never be used as a weapon.

He also discussed a phased-array transmitting antenna, which has already been constructed as a five-story-high project in the Aleutian Islands.

Glaser estimated a power efficiency of 84 percent for 30 kilowatts of power. He

compares current power plants having an efficiency range of about 40 percent. No scarce materials are needed, he pointed out, and a Solar Power Task Force estimated an energy payback for a solar power satellite to be surprisingly short.

Glaser feels strongly about this country taking steps to assure that the solar power satellite option is available by the time the "true energy problems surface, around the late 1980's."

Center Director Christopher Kraft indicated that there would be many worthwhile space programs of the future, some of them on-going programs, and three additional areas that represent major changes from past programs, or new initiatives. These three include projects to evaluate the solar power satellite concept, the new field called space processing, and a major change in our approach to communications satellites.

Kraft pointed out that while it might not be obvious at first, all three of these initiatives require the development of several basic and similar technologies, such as the building of large structures. He showed the benefits to be derived from space processing, especially in the biological and industrial fields.

"Consequently," Kraft stated, "a space program which develops the techniques for large power supplies and structural systems provides us with the basis to select and implement any or all of these promising applications as future needs of the country dictate."

Richard L. Kline of the Grumman Aerospace Company, Deputy Director for the NASA Space Programs at Grumman, dealt specifically with the technology and development requirements for such a concept. Mass-production was emphasized as important to implementation of a high-volume/low-cost system and he said that engineering development was more necessary than any scientific breakthroughs.

Gordon R. Woodcock of the Boeing Aerospace Company, prime contractor out of JSC for study of the solar power satellite concept, went into cost considerations. Woodcock said that his figures were based on a 10,000-megawatt solar power station using solar photovoltaic conversion with two transmitting antennas and two ground stations. He said he was trying to take in every facet of the concept.

The bottom-line figure turned out to be \$2600/kilowatt. He noted that that figure represented a very early satellite and that the cost was expected to come down as technology improves and as design matures. This, he said, could be compared to the success of the pocket calculator that started out at a price of around \$200 and can now be bought for around \$20.

Moyer said that the only fallacy he found in Glaser's lecture was his reference to solar satellite power as "an option."

"An option, to me, says you can either take it or leave it; that you don't have to go that route. And I don't see what the alternate route is at the moment." He cited nearly every conceivable energy concept.

"As far as I'm concerned," Moyer continued, "the utilities are going to be a customer for one to 100 solar power satellite stations, and before you come running up to me with your sales pitch, I'll just say you've already made it! Now we've got about 12 to 15 years to negotiate the price!"

Moyer leaves to the historians data concerning how much time it takes a society to accept new technologies and for new technology to mature. Referring to the previous day's session, he said that statistics concerning the automobile, the airplane, and so on are not really comparable to solar power satellites because, as he put it, "we've never really NEEDED the automobile; we've never really NEEDED the airplane... we've never needed the freeways in Los Angeles!" A round of laughter ensued.

"But what happened, you see, is as soon as they were possible and someone figured out how to pay for them, we built freeways into NOWHERE out of Los Angeles. And in a matter of no time at all, there were people going down that freeway and building homes in places they thought were less costly — little did they know... — and people who used to get on a train from New York to San Francisco thought it would be fun to do that in four or five hours, and a few years ago we were even considering cutting that trip down to an hour or so. The price tag was wrong at the time, and I suppose there is a kind of compelling urgency to catch up with what is possible..."

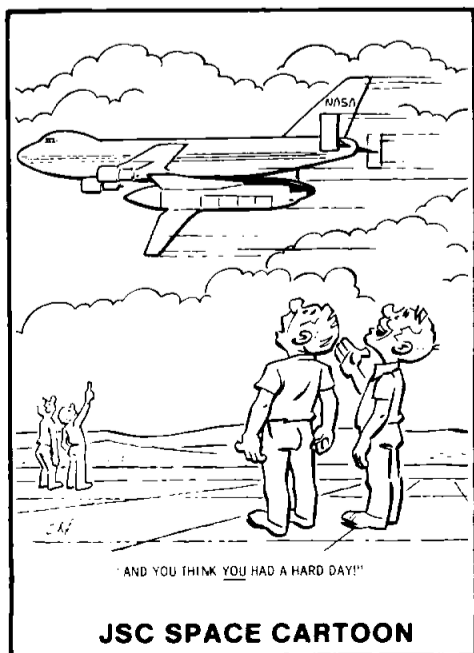
"But, you see, that's not what we have at the moment. We have a compelling urgency in the sense of survival, in terms of economic growth, and in terms of protecting and expanding the kinds of life quality we cherish in this country."

Moyer's whole talk centered around "what are we waiting for?" He named only two things he saw as standing in the way of solar power satellite development: a sudden and dramatic decrease in population due to some catastrophe, which would delay the energy crisis for a period of time, and another possibility that sent the audience into peels of laughter — "if Ralph Nader gets into cloning..."

And he wouldn't speculate about that!



ENERGY CONFERENCE LECTURES — Shown are speakers (left to right) Christopher C. Kraft, James W. Moyer, Gordon R. Woodcock, Richard L. Kline, Peter E. Glaser, A. F. Hildebrandt, and chairman John W. Freeman.



JSC Sports Section

RUNNING EVENTS

Don't forget the JSC-Bay Area Run Club Roadrace Sat., April 8 at 9 a.m. and the Houston-Galveston Area Industrial Recreation Council-JSC Fun Run Sat., Apr. 15 at 10 a.m. These events were described in the last issue of *Roundup*, and entry dates are very close. Contact Richard Barton, X-5181, concerning the first race and Tim Kincaid, X-3594, about the Fun Run for further information or entry forms.

JSC GOLF

Thirty-two golfers from Group I of the JSC Golf Association descended on Glenbrook Golf Course March 11 for the first medal-play tournament of the year. It

was an interesting tournament and tended to reflect our lay-off during the long, cold, and wet winter. Reportedly, some of our members were reduced to finishing the round with X-ed out "Flying Ladys."

Those who weren't quite so rusty were our winners; Jake Klinar, net 70; Andy Anderson, net 71; George Champagne, net 71; and Jerry Shinkle, net 72. Also shooting net 72's were Milt Heflin, Jim Poin-dexter, Bill Shropshire, and Joe Nick Villarreal. Heflin's 79 was low gross.

Our next tournament is tomorrow. Group I will be playing Wortham; Group II will open their season at Brock Park.

RUSH

YOUR COST REDUCTION REPORT TO . . .

**COST REDUCTION OFFICE BH-4
ON A JSC FORM 1150 !**