



CA1 Crewmen Haise, Fullerton at breakfast; the walk to the spacecraft; first manned takeoff; crew egress



THEY SHE GOES — Approach and Landing Test flight director Don Puddy, CAPCOM Karol Bobko and crewmember Joe Engle watch the monitor in the ALT Control Room in Bldg. 30 during takeoff of the 747/Orbiter for Captive Active 1, June 18. Fred Haise and Gordon Fullerton flew CA1. Engle and crewmate Richard Truly are scheduled to fly CA2, now slated for June 28.

# ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS

VOL. 16 NO. 13

Friday, June 24, 1977

## After several postponements, CA1 was nearly perfect flight

Astronauts Fred Haise and Gordon Fullerton were elated; the flight control team led by Don Puddy in Houston were happy; the eye-witnesses at Dryden were ecstatic.

Orbiter 101 made its maiden manned flight last Saturday and no one could find significant fault with Captive Active 1.

The vehicle checked out flawlessly during two hours of pre-flight preparations. Carrier aircraft commander Fitzhugh Fulton and his 747 crew reported the big Boeing with its spacecraft passenger was ready for takeoff.

So, at 10:07 a.m. CDT, the mated pair took to the air as gracefully as they ever did during captive inert testing.

The Orbiter systems seemed to be performing right on cue during the 54-minute flight. A minor data transmission problem prolonged the flight for a few minutes but the Building 30 flight control team regained their data links and proceeded to follow the timeline right according to schedule.

The objectives of this first flight — the flutter tests, control stick steering tests, and speed brake tests

— were easily met during what seemed to be a perfect flight.

Fulton reported later, "We could tell when the speed brake was deployed but there wasn't any turbulence to the craft at all.

The Orbiter crew, Haise as commander and Fullerton as pilot, were obviously pleased with the flight. They reported during a post-flight press conference that the spacecraft performed beautifully.

Fullerton expressed tremendous admiration for the performance of the Orbiter. "All the simulations we have gone through stressed malfunctions, but we were really surprised and pleased to be aboard OV-101 and not see any malfunctions at all," he said.

As graceful as the 747-Orbiter were when they took off, nothing could match Fitzhugh Fulton's landing.

The crew went through power-down and left the Orbiter to the grins of FOD Director George Abbey, and Astronaut Chief John Young.

ALT Program Manager Donald K. "Deke" Slayton said at the press conference, "obviously we're more pleased today than we were yesterday," referring to the 24-hour hold he had announced on Friday after it became apparent one of the Orbiter's computing systems would need to be changed.

Slayton said the second test, Captive Active 2, was on schedule and should fly on June 28. That flight will evaluate Orbiter dynamic structural characteristics and will include one pushover and separation trajectory.

At press time, the first Free Flight was being tentatively scheduled for the third week in July.

## Werner von Braun: rocket scientist dies

Dr. Werner von Braun died of cancer June 16 at the age of 65.

Von Braun, a pioneer in the development of rocketry, left a legacy which began with his work on the German V2 rocket bomb and ended with the Saturns which put Americans on the Moon.

Von Braun was director of NASA's Marshall Space Flight Center, Huntsville, Ala., when the Apollo launch vehicle was developed.

Dr. Christopher C. Kraft Jr., director of JSC, said of von Braun, "All of us that knew him respected his leadership and the very great contributions he has made to the U.S. space program.

"He certainly was deserving of the statement of being a legend in his time," Kraft said. "We at JSC will miss his presence and support, for he was a great man."

Dr. Alan M. Lovelace, acting NASA administrator, compared von Braun to Newton and Einstein and said, "he was a dreamer pursuing visions and, at the same time, a creative genius.

"He was a 20th Century Columbus who pushed back the new frontiers of outer space with efforts that enabled his adopted country to achieve a pre-eminence in space exploration," Lovelace said.

Von Braun became an American citizen in 1955. "To millions of

Americans, Werner von Braun's name was inextricably linked to our exploration of space and to the creative application of technology," President Jimmy Carter said in a statement.

"Not just the people of our nation, but all the people of the world have profited from his work. We will continue to profit from his example," Carter concluded.

Von Braun resigned from NASA in 1972 to become vice president of Fairchild Industries, Germantown, Md.

He died in an Alexandria, Va., hospital following a two-year illness with cancer of the colon. A private funeral was held prior to the announcement of his death.



Dr. Werner von Braun (1912-1977)

## Dr. Frosch confirmed as new administrator

Dr. Robert A. Frosch was confirmed as new NASA administrator by the United States Senate June 16.

Following are excerpts of answers made by Frosch to selected questions of the Senate subcommittee which heard his nomination.

**Question:** Do you view the Space Shuttle as initiating a new era in the exploration of space and the use of space to meet the needs of mankind?

**Frosch:** The Shuttle is frequently discussed in terms of its ability to accomplish the things that we are already able to do in space but in a more economical way. I believe its real significance lies in its ability to enable us to do new things in space that we cannot now do be-

cause of restrictions imposed by expendable launch vehicles.

In particular the ability to make repeated routine missions with large payloads will make it possible to approach space observation and experimentation from the point of view of constructing experiments in space rather than totally pre-designing them.

The ability to build, to test, and to experiment in low and medium Earth orbit can significantly change the kind of space exploration and applications that we can hope to achieve.

**Question:** What major new projects would you propose that NASA consider for the post-1985 period?

**Frosch:** I believe that our initial

(Continued on page 4)



**HAPPY ACHIEVEMENT** — The fifth graduating class of JSC's Management Development Program (MDP-V) was honored at a luncheon this month in the Executive Dining Room. The four-semester program is under the codirection of JSC's Employee Development Branch and the University of Houston at Clear Lake City. L to r, standing are: R. H. Dietz,

Charles Crews, Edward Pavelka, John Papac, William Simon, Lewis Casey, Charles Allday, Edward Armstrong, Dr. Dutch Holland and Dr. Rosemary Pledger. Seated are: Don Travis, James Jaax, Raymond Bradley, Curley Dartz, Dr. Walt Natemeyer, Nat Hardee and Jay Harnage. Not shown are C. W. Vowell and Kenneth Young.

## Tuesday seminars on energy open to educators, employees

Special seminars on energy are being held every Tuesday in the Bldg. 30 auditorium as part of the 1977 Summer Faculty Institutes sponsored by NASA and the American Society for Engineering Education.

The seminars, which are open to employees, are held from 2-3:30 p.m. They began June 14 and run through Aug. 2.

On June 28, Dr. James H. Kelley, manager of Hydrogen Systems & Technology at the Jet Propulsion Laboratory, will present "Hydrogen Energy System."

On July 5, Robert Herring, chairman of the board of Houston Natural Gas Co., will present "Natural Gas: Economic Outlook."

On July 12, Augustine Verrengia of JSC's Space Shuttle Program Office will discuss the Shuttle program.

On July 19, George W. Oprea, executive vice president of Houston

Lighting & Power Co., will present "Energy, Employment and Growth."

On July 26, Prof. H. W. Prengle Jr., chemical engineering, University of Houston, will present "Energy Conservation in Industrial Operation."

On Aug. 2, Dr. John H. Lichtblau, executive director of the Petroleum Industry Research Foundation, Inc., of New York City will present "World Oil Supply and Demand."

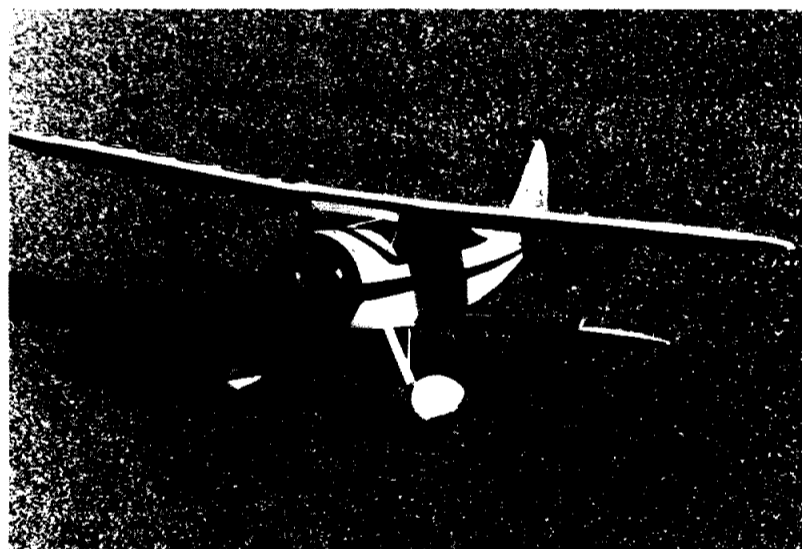
The two seminars already held were "Solar Energy: Collection and Utilization" and "Coal Liquefaction."

For additional information, contact Mary Cook, X-4187.

The NASA/ASEE Summer Faculty Fellowship Program is designed to give engineering and scientific educators an opportunity to spend 10 weeks at a NASA center working on a research proposal or design

project.

This year's project is entitled "Manned Utility Space Craft Auxiliary" and involves 23 research fellows and 18 design fellows. Lou Livingston of the Spacecraft Design Division is technical coordinator.



**AIRPLANE MODEL** — This is John Kiker's scale model of a WACO-SRE which is representative of the types of radio-controlled airplanes which will be flown at JSC this weekend. Kiker's model has a five-foot wingspan and is powered by a K&B 40 engine. The full-sized WACO-SRE was built about 1935 and carried four passengers.

## Radio Control Club slates model contest

The JSC Radio Control Club is holding a model airplane exhibition and contest Saturday, June 25, and Sunday, June 26, on the antenna range behind Bldg. 14.

Saturday's event will be a "fun fly" from 10 a.m. to 6 p.m. where the tasks to be flown will be determined by a roll of dice and the pilot will then perform the maneuver in the shortest possible time.

On Sunday, there will be three events beginning at 9 a.m. First will be a scale model contest where models are statically judged for appearance, accuracy and workmanship and then are flown in a series of maneuvers.

The second event will be a stunt pattern contest for biplanes. The third event, to be held during the lunch hour, will be a biplane barn-

## ALT color TV team receives JSC honors

Awards were given recently to 34 individuals and one contractor firm in recognition of their contributions to the development of the color television system utilized in the observation and support of the Shuttle Approach and Landing Tests.

Dr. Christopher C. Kraft Jr., JSC director, presented the awards during ceremonies May 31.

James C. Stamps, chief of the Television Office, Photographic Technology Division, received the center's highest award, the Certificate of Commendation.

Stamps was recognized for "his outstanding technical skill and leadership in defining and bringing to full operation the color television system" used for ALT.

In recognition of its outstanding support, Kraft presented a JSC Certificate of Appreciation to the Taft Broadcasting Corp. Accepting on behalf of the organization was the corporation president, Paul E. Taft.

Finally, Group Achievement Awards were presented to the Shuttle Approach and Landing Test television team.

Wayne E. Koons of the Orbiter Project Office and Joseph E. Mechelay of the Integration Division, Program Operations Office,

accepted the award on behalf of the team.

Individual certificates were then given to 28 NASA employee members, two Technicolor Graphic Services, Inc. employees and one Serv-Air, Inc. employee.

## Orbiter contract modified

JSC has signed a \$40 million letter contract with Rockwell International Corp. Space Division, Downey, California covering modifications to the first Space Shuttle Orbiter and for start of design work for the third Orbiter.

Funded in part by the Economic Stimulus Bill, the contract is aimed toward generating additional employment opportunities.

The center also signed a supplemental agreement with Rockwell covering work deleted from the Space Shuttle Orbiter contract.

Covering two contract changes for deletion of a neutral-buoyancy trainer and vibroacoustic testing of the Orbiter aft fuselage, the decrease of \$25,334,750 lowers the value of the cost-plus-award-fee Rockwell contract to \$3,013,971,603.

Most of the deleted work was to have been done in Rockwell's Downey plant with support from Houston and Kennedy Space Center field offices.

## Pan Am contract signed

JSC has signed a contract with Pan American World Airways, Inc. Aerospace Services Division for center plant maintenance and operations support services.

The contract covers operation of all utility systems and maintenance of utilities, buildings, roads, ditches and special equipment.

Pan American will employ about 300 people for the year ending April 30, 1978. The cost-plus-award-fee contract has an estimated value of \$7,470,591.

## Rendezvous Festival scheduled July 9-24

### CALENDAR OF EVENTS

(For more information, call 488-8748.)

- July 9 — **Boat Parade:** 5 p.m. at Seabrook-Kemah ship channel.
- July 10 — **Model Airplane Contest:** 10 a.m.-5 p.m. at Boeing Co. parking lot, Bay Area Blvd. Free.
- July 15 — **Golf Tournament:** 10 a.m., Clear Lake Country Club. Call Jack Bakos, 488-4700 for reservation.
- July 15-16 — **Children's Carnival:** 10 a.m.-6 p.m., Clear Lake High. Ages 2-12, 25 cents/ride.
- July 15-17 — **Antique Show:** Noon-9 p.m. (6 p.m. Sunday), Clear Lake High. \$1.25/person.
- July 16 — **Fishing Tournament:** Kemah & Seabrook Flats. Call Jerry Zuber, 332-4502 for info.
- July 16-17, 23-24 — **Tennis Tournament:** Men's, women's, singles, doubles play, \$4/person/tourney, \$4.50/person/mixed doubles. Entry blanks due July 11, available at Bay Area, Friendswood, Windmere racquet clubs & Nassau Bay Bank.
- July 17 — **Progressive Country-Western**

**Music Festival:** 1 p.m., League City Civic Center, Floyd Tillman & others. \$7.50/person, \$12/couple.

July 17 — **Wine Tasting:** JJ's on NASA Rd. 1, tickets presale only.

July 19 — **Lunar Rendezvous Style Show:** 11 a.m., Pier 8, Seabrook. Texas Designer's Showcase champagne luncheon. Call Laye Winters, 474-2156 or 488-2666 for information.

July 20 — **Bridge Tournament:** 7:30 p.m., Lakewood Yacht Club, Seabrook. Duplicate & rubber, \$3/person.

July 23-24 — **Texas Arts & Crafts Coastal Regional Show:** 10 a.m.-8 p.m., UHCLC. \$1.50/adults, 75 cents/children.

July 23 — **Canoe Races:** Harris County Park to Galveston County Park. Call Pat Simmons, 337-2612, for info.

July 23 — **Lunar Rendezvous Ball:** Gilruth Rec Center. 1977 Lunar Queen will be crowned by Susan Lovell, Queen for 1976.

**Every Weekend During Rendezvous — "South Pacific:"** presented by Clear Creek Country Theater.

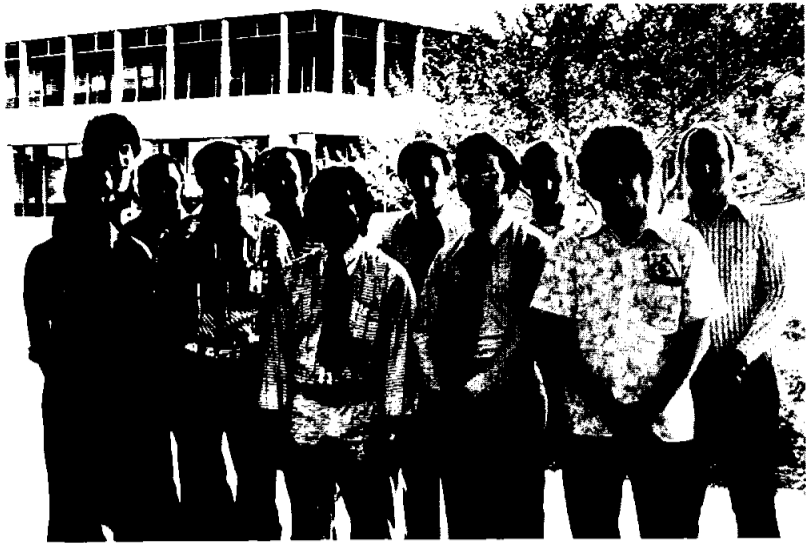
## ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

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Photographer: A. "Pat" Patnesky



**SOFTBALL CHAMPS** — The Miller Freeman Ford Mets, above, won the Men's A League softball championship for the sixth consecutive time this season by beating the Dynamos 12-10 in a playoff. Shown here, 1 to r, front row are: Donny Merek, Al Morrey, Nat Hardee, Mickey Brunjes and Manager Richie Holtje. Back row: Phil Shannahan, Jim Smith, Jack Boykin, Wayne Whittington, Richard Kruse and John Kaderka. Not pictured are Chris Mitros, Charles Cones and Kevin Snedecor.

# EAA ATTRACTIONS

## TICKETS

The following tickets are available at the Bldg. 11 Exchange Store from 10 a.m.—2 p.m., Monday — Friday:

**Astroworld** — Adult & children tickets available for \$6.95 each. That's a \$1 discount.

**Dean Goss Dinner Theater** — Comedy production, *Agatha Christie Made Me Do It*. Tickets \$16/couple available for any night except Monday, Saturday, through July 3.

**Disney Magic Kingdom Club** — Free membership cards.

**Sea-Arama Marineworld** — Tickets on sale, \$3.75 for adults, \$2.50 for children. Open until dusk, year round.

**Six Flags** — Adult & children tickets, \$6.75 each. That's a \$1.20 discount.

Sunday's NASA Outing at Astroworld.

Admission tickets good all day June 26, 10 a.m. to midnight, are being sold by the EAA for \$5.45. Regular admission price is \$7.95.

Here's your chance to take the family to Astroworld at a substantial savings and put yourself in the middle of fun.



## SUMMER CLASSES

**Group Tennis Lessons** — Register by July 1 for a group of 8 lessons starting July 12. Classes meet Tues & Thurs for 4 weeks. Beginners, 8:45-9:45 p.m. Intermediates, 7:30-8:30 p.m.

**Intermediate Ballet** — Sign up by June 29. Classes start July 5, Tues & Thurs nights for 6 weeks, 6:30-7:30 p.m. Rosemary Killen, instructor. \$17.50/person.

**Women's Exercise Class** — Sign up by June 29. Classes start July 5, Tues & Thurs nights for 6 weeks, 7:45-8:45 p.m. Rosemary Killen, instructor. \$17.50/person.

## SKETE LEAGUE FORMING

Interested in sharpening up your shotgunning skills for greater effectivity afield this fall? Hunting season will be here before you know it! Even if you've never shot a scattergun before, you can now get in on the ground floor.

The JSC Claybusters Skeet League will begin Thursday, July 7, for 10 weeks at the Clear Creek Gun Range, located on FM 1266 in League City. Shooting hours will be flexible. Call Bill Simon at X-4027 if you are interested in signing up.

## SOFTBALL FINALS

The Miller Freeman Ford Mets won the Men's A League in competitive softball for the sixth consecutive time by beating the Dynamos in a playoff, 12-10. The Mets finished the season 12-2.

In the Men's B League, the Animals finished first over Century 21. In the Men's C League, the Mulletts triumphed over the Nerds.

In the Women's League, Charlie's Angels and We're Good tied for first place.

## NAUTILUS DISCOUNTS

For a limited time, Nautilus Health & Fitness Center is offering special membership prices through the EAA to NASA and contractor employees.

You must join by July 30. The center is at 1120 NASA Rd. 1, Suite 100. Facilities include Nautilus equipment, sauna, whirlpool and swimming pool.

Special rates are from \$75 to \$100 off. Call Jim King in CLC, 333-4848, or Ray Waldvogel in Pasadena, 475-1267, for more information.

## ASTROWORLD FOR \$2.50 OFF

Rush to the Bldg. 11 Exchange Store before 2 p.m. today, June 24, and you can still get tickets for

## GET IN THE ACT



JUST SEND YOUR COST REDUCTION REPORTS (FORM 1105A) TO H.M. HUGHES, BH23 NOW!

# Roundup Swap Shop

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 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

## CARS & TRUCKS

- 1970 Pontiac Catalina Sta Wgn. Pwr, air 72K mi. \$650. Donahoo, X-5276.
- 77 Ford LTD. Many xtras, 7600 mi. List \$7,200. Sell for balance of \$5,500. Tomkins, X-5331 or 534-2276.
- 71 Camaro 350 V8. Headers, dual exhaust auto, all pwr air tilt wheel, Sears steel radiats, new paint, clean. \$1,950. 1511 Beachcomber 488-2797 after 6.
- 73 Merc Marquis Brougham 47K mi, new tires, all pwr. \$3,200. Smith, 479-4568.
- 72 Pontiac Catalina 4 dr \$800. 534-2021.
- 75 Chevy Monza 2-plus-2. Air, 4 spd, 4 cyl radlo, 24K mi. \$2,500. 481-3450.
- 73 Olds Cutlass Salon. Brown w/ brown vinyl top, tan corduroy inside, air, pwr, AM/stereo tape, 40K mi. Below whsale. \$2,300. Hamilton, X-5107 or 488-6120.
- 73 Capri. Like new, air, AM FM stereo, great gas mileage. \$2,000. Bostick, 474-4991.
- 71 Capri. 1600cc, 4 spd, body fair, eng good, new clutch, 79K mi. 941-2131.
- 74 Camaro. Pwr, air shocks, AM/FM stereo, 43K mi, good shape. \$2,800. 332-3386 or 784-2187.
- 70 Buick LeSabre. 4 dr, air, auto, pwr steer, good cond, 81,500 mi. \$950. 946-7587.
- 65 Olds Dynamic 88. 1 owner, \$250. 334-2129.
- Hi-performance 289, rebuilt, all new, less than 4,000 mi, \$850. C-4 automatic shift kit, B&M ratchet shifter, \$300. 471-2447.

## CYCLES

- Custom built 750 chopper. Show quality, 1976 eng, 1 adult owner, very low mileage. \$3,200. 471-2447.
- Motorcycle, BMW. Low mileage, xint cond. 331-6861.
- 75 Honda 750 Super Sport. Blue, rack factory lugg carr/sissy bar. Xint cond. \$1,600. Bullock, 488-6095.
- 71 Honda CB 450. New custom paint, crash bar, lugg rack w/3 bags, fairing, runs xint. Dennis, X-5293.

## BOATS & PLANES

- 1976 Cobalt 18', 175 OMC I/O Sportsman trailer. Loaded, xtra clean, 50 hrs total time. Alexander, X-5056 or 333-3972 after 5.
- King KX-160 Nav/Com. Recently recertified on all channels. \$500. Pruett, X-4491 or 487-4914 after 5.
- Michigan Aluminum Propellers: Fit John/Evin/Gale 60-75-80-90 HP. PJ 75, 10 1/4" X 10", like new, \$17. PJ 78, 9 1/2" X 10", never used, \$22. 481-5050.

## CAMPING EQUIPMENT

- Puma Camper Trailer. Icebox, 3-brnr propane stove, sleeps 6, water tank, hookups. White, 554-2916.
- Cab-height walk-in camper shell. LWB, insulated, good cond. \$80. Donahoo, X-5276.
- 8'X10' Wanderer Cabin Tent, never used, \$50. 10'X12' Riverside Cabin Tent, xtra lg windows, exterior alum frame, \$50. 554-6102 or 554-7076.
- Nimrod Tent Trailer. Sleeps 4. 482-7775.

## PROPERTY & RENTALS

- Beautiful 2 acre partial wooded residential lot, El Lago. Cash or terms. 334-3370.
- Colorado Mountain property. 9500 ft, pine, aspen, beautiful view, road. 40

- acres, \$24,000, owner will finance. Lowenstein, X-3918 or 332-3551, Rm 157.
- Rent: Lake Livingston, Cape Royale. New 2 bdrm waterfront home compl furn, facil incl tennis, pool, golf, boat launch. By wk or mo, 488-3746.
- Sale: Islander East Condo. Top floor efficiency, xint Gulf view, balcony, tennis, beach, swim pool, furnished. 481-3397 after 6.
- 3 bdrm house for rent, Seabrook. Avail July. \$250/mo. Horton, 334-2360. Must sell lot on Lake Somerville (Birch Creek Forest). Wooded, adjac to small lake, boat access to Lake Somerville, water system, rec facil. Schmidt, X-4063 or 333-4379 after 5.
- 3-2-2 in walk dist to Clear Creek High. Fenced bkdy, patio cover, disposal, dishwasher, lg walkin closets. White, 554-2916.
- Galveston West End. 2 bdrm By-the-Sea Condo apt, full furn. \$180/wk off season, \$260/wk in season. Clements, 474-2622.
- Sale: 1 acre wooded, undevel property at Beaver Creek. 9 mi from Lake Somerville. Must sell immediately. Schmidt, X-4063 or 333-4379 after 5.
- Lease: New 3 bdrm, 2 bath, Wood Meadow next to Sagemont. Avail abt July 1, \$395/mo. 334-3202 after 5.
- Reserve for vacation now. Jamaica Beach, Galveston. New 2 story. \$175/wk. 334-1640 after 5.
- Family plot (6 lots) for sale. Forest Park, Gulf Fwy. 488-2843 after 5.

## MUSICAL INSTRUMENTS

- Piano lessons: Register early for beginner piano lessons (adult & children). Accepting limited no. starting 1 Aug. 333-4590 after 6.
- Conn guitar, 2 yrs old, used little. Will trade for propane camp stove or \$40. Ezell, X-2838 or 332-5219.
- Hammond M-111 Organ w/bench. Early Amer design. \$800. Jones, X-3803 or 471-2638 after 5.
- Flute: Gemeinhardt, French model, open hole, xint cond, \$150. Trombone: King Tempo, good beginner instrument, \$100. Miller, X-4507 or 471-4390.

## HOUSEHOLD ARTICLES

- Like new Hoover floor polisher w/brushes, pads. \$20. 334-3370.
- Desk, exec office type. Metal w/plate glass top, 60"X32", xint cond. Cost over \$200. Bargain at \$100. Handley, X-2271 or 482-7041.
- Rug, oval 9X12, wool. Gold/beige/brown, needs minor sewing. \$25. Zrubek, 333-2549.

## MISCELLANEOUS

- Sears Craftsman electric edger, \$15. Nacedak bow (50 lb), custom alum ar-rows & access, \$40. 554-6102 or 554-7076.
- S&W Model 15 Nickel .38 Spec, \$170. Model 18, 22LR, \$190. Both new in box w/all papers. Handley, 482-7041.
- Konica 35mm f3.2 Auto Hexanon wideangle lens for Autoreflex T or TC cameras, \$70. Also 2X teleconverter for same camera, \$15. Patterson 8X10 print washer, new, \$30. Pruett, X-4491 or 487-4914 after 5.
- 74 Buick shop & body manuals, \$7 set. Sta wgn 2000 lb hitch, fit 71-76 GM lg wgn, \$15. Commercial style black-light, two 48" tubes, preheat rapid start, \$30. Soda-acid copper-brass fire exting, \$25. 481-5050.
- Four ER 78-14 Goodrich Lifesaver radial tires. Used 8,000 mi. 554-3885 after 6.
- Gravelly Tractor w/mower & Sulky,

- \$250. Mac 250 pro chainsaw, \$125. Anderson, X-7204 or 485-2035.
- Trunk lid chrome lugg rack for Ford cars, never used. New \$85, sell \$25. Marchal, 534-3021 after 5.
- 30-06 rifle w/scope. \$125. 331-1279 or X3734.
- Lynx titanium shaft 4-wood, like new, \$60. Archer soldering gun, \$7.50. Gorman, X-4576 or 521-9805.
- Auto rear speaker kit, two 6X9 spkrs w/grills, wire, mounts, All new. \$20. Pruett, X-4491 or 487-4914 after 5.
- Class I trailer hitch w/chrome ball. Fits 73 Chevy sta wgn, bolt assemb, no rust. \$20. Smith, X-4468 or 488-3238.

## WANTED

- Want late model 3/4 ton pickup w/ self-contained camper. 337-1160.
- Used, good quality, 3-person nylon tent. Ezell, X-2838 or 332-5219.
- Lot suitable for 14X80 mobile home. Pad, shade, utils desirable. Location Bay area, Wimberly, Kerrville. Kline, X-3252 or 433-4018.
- Female roommate to share 3 bdrm 2 bath apt. Neat, reliable, honest. Norma, X-2301.
- Need riders for carpool from W Loop, SW Fwy, Bellaire area, 8-4:30. McLaughlan, X-5536 or 661-2974.
- Firefighters needed. Men, women residents of CLC for CLC Vol Fire Dept. Will train & equip. Call 488-0023 anytime.

## LATE ENTRIES

- 77 Plymouth Voyager Sport Window Van. 127" WB, sliding door w/vent, loaded w/options, acces. 474-4663.
- 73 Merc Monterrey. Air, pwr, auto, stereo, WW radials, xtra clean. \$1,950. 472-4456.
- Exhaust headers. Fit 340 Dodge eng. \$50. 946-4458.

# JSC Crossword

(See answers, page 4)

## ACROSS

- Fruiting head of a cereal
- Several
- Mop
- Preposition
- Mexican currency
- 13th Greek letter
- He opposed Texas' secession
- Like
- Rate Gyro (acronym)
- JSC's Hawaiian contractor
- Symbol for Radium
- Proximate
- Follows "either"
- Unassisted
- Recent events of interest
- Goal in many sports

## DOWN

- Psychic ability (acronym)
- Fear, reverence
- With disregard for consequences
- Specific program operations
- Article
- Has flown four space missions
- Shuttle's two are recoverable

1	2	3			4	5		6
7			8		9			
10							11	
			12					
13	14						15	
16						17		
18					19		20	21
			22		23			
24							25	

- Negative of 22 across
- Ohio city
- Pre-Shuttle landing site
- Inert gas one might associate

- with motel sign
- Strong beer
- Decompose
- Exclamation of pain

# Frosch confirmed...

(Continued from page 1)

experiences with these new capabilities (described above) will begin to give us entirely new ideas for long-range projects.

It is only when we begin to understand what we can do with this new tool and new way of approaching problems in space that we will be able to make sensible plans for using the Shuttle and the technologies it makes possible in the post-1985 era.

**Question:** What criteria should be used in evaluating these projects?

**Frosch:** There are three major criteria that I will apply in evaluating new long-range project possibilities: usefulness to human life, intellectual importance and economic feasibility in the light of conditions prevailing at the time.

**Question:** Should NASA devote a greater portion of its planning effort to social and behavioral science aspects of space activities?

**Frosch:** I interpret this question as referring to research to be undertaken to prepare for future manned activities in space. There is no question that future possible human activities in space will involve long-term exposure to isolation either individually or in very small groups in unfamiliar and sometimes dangerous situations.

This is not an unknown situation, and considerable social and

behavioral research has been done on it with respect to aspects ranging from individual sensory deprivation, through studies of small group interactions in mountaineering teams, submarine and aircraft crews to scientific teams in underwater habitats.

NASA has participated in a good deal of this research, and NASA people are familiar with what is known about these situations.

I believe that continued careful exploration of these situations and problems will be an important part of the biomedical program that we undertake to understand the effects and characteristics of work in space under the particular conditions that will prevail there.



Dr. Robert A. Frosch

# Space settlement book available

A new book titled, "Space Settlements: A Design Study" (NASA SP-413), describing in detail construction and operation of permanent settlements in space where up to "10,000 people work, raise families and live out their lives," has been published by NASA's Scientific and Technical Information Office.

The futuristic, comprehensive, 185-page volume is the result of a 10-week study conducted during the summer of 1975 to determine "engineering systems design of

space settlements." The book's eight chapters include such topics as physical properties of space, human needs in space, habitat designs, space manufacturing, agriculture and settlement locations. It is the most comprehensive engineering study of the subject undertaken to date.

The report concludes that "permanent communities can be built and inhabited off the Earth." It goes on to say that "the obstacles to further expansion of human

frontiers in this way are principally philosophical, political and social rather than technical."

"Space Settlements: A Design Study," edited by Richard D. Johnson, chief of the Biosystems Division at Ames Center, and Professor Charles Holbrow, Department of Physics and Astronomy, Colgate University, is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for \$5. The stock number is 033-000-00669-1.



Gerald P. Carr

# Carr leaves NASA to join Houston firm

Skylab 4 commander Gerald P. Carr will leave the astronaut group at JSC June 25 to join the Houston consulting engineering firm of Bovay Engineers, Inc.

Carr was one of 19 astronauts selected in April 1966 and he shares the world's spaceflight duration record of 2,017 hours (84 days) with

his Skylab 4 crewmates Dr. Edward G. Gibson and William R. Pogue.

He retired from the U.S. Marine Corps in September 1975 to become a NASA civilian employee.

At Bovay Engineers, Carr will be the corporate manager for business development. "Leaving a career in aviation and spaceflight is a difficult thing to do, but I feel that it is time for me to take a new direction," said Carr.

"I wouldn't trade the past 22 years as a Marine aviator and astronaut for any other experience, and I look back over those years with great satisfaction," he said.

Carr headed the design support group within the JSC Astronaut Office at the time he joined Bovay. With Carr's departure, 27 astronauts remain on the active list at JSC.

# Griffin assumes new post

Gerald D. Griffin, formerly of JSC, has been named deputy director of the Kennedy Space Center, Fla.

Griffin, 43, will assume the new job about July 1. He replaces Miles Ross who resigned from NASA in May.

At JSC, Griffin was a Gemini flight controller, a flight director during all 11 Apollo missions and lead flight director on Apollos 12, 15 and 17.

He later served three years at NASA Headquarters, first as assistant administrator for legislative affairs and later as deputy associate administrator (operations) in the Office of Space Flight. Since 1976, he has been deputy director of Dryden Flight Research Center, Calif.

# Leadership seminar set for June 28-30

A three-day noon seminar on the life cycle theory of leadership is being repeated by the Employee Development Branch in cooperation with the University of Houston at Clear Lake City and the central campus.

The seminar will be held June 28-30 in Bldg. 2 auditorium. It is open to all JSC employees and contractor personnel.

An introductory lecture on life cycle theory will be given from 12-1 p.m. June 28 by Dr. Walter Natemeyer of UHCLC.

From 12-2 p.m. June 29 there will be a showing of the Academy

Award-winning motion picture "Twelve O'Clock High" starring Gregory Peck.

On June 30, from 12-1 p.m., Dr. Winford "Dutch" Holland of U of H will lead an analysis and discussion of the leadership styles and techniques represented in the film.

The life cycle theory of leadership provides managers with practical guidelines for working effectively with employees and the movie provides viewers with an opportunity to observe various leadership styles as portrayed in a dramatic production.

## JSCrossword answers

(See puzzle, page 3)

1	T	2	E	3	N	4	S	5	W	6	E	7	N
8	L	9	O	10	S	11	R	12	O	13	R	14	O
15	R	16	A	17	N	18	E	19	A	20	R	21	A
22	G	23	I	24	S	25	R	26	K	27	E	28	N
29	N	30	O	31	S	32	T	33	H	34	O	35	H
36	U	37	N	38	S	39	O	40	S	41	P	42	E
43	O	44	N	45	I	46	B	47	A	48	W	49	S
50	Y	51	A	52	M	53	A	54	R	55	A	56	R



When the pesky bluejay's flown, and the humans both are gone, a bushy-tailed little beast helps himself to a birdseed feast.

Photos by Patnesky