

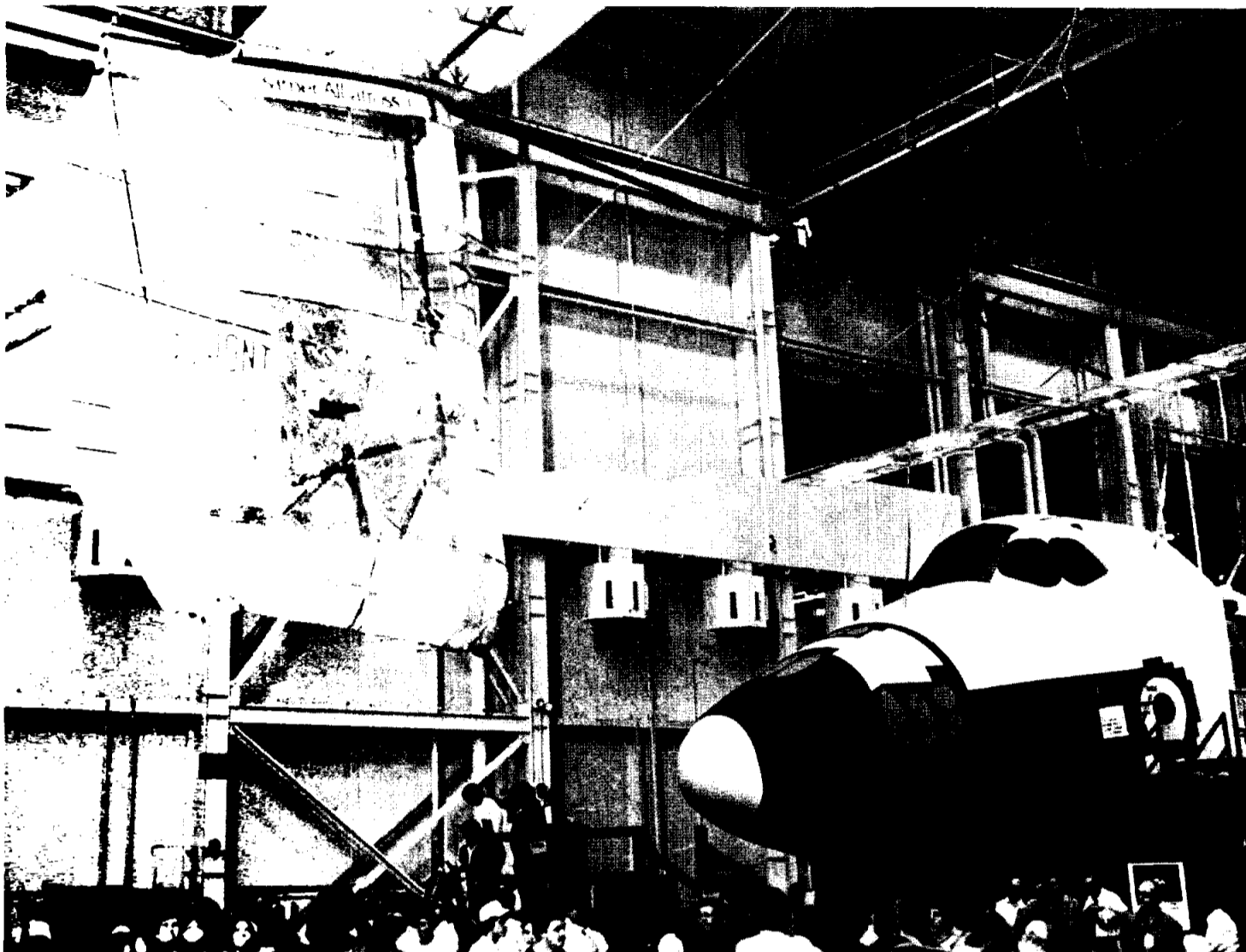
# ROUNDUP

Lyndon B. Johnson  
Space Center

NASA

April 21, 1980 Houston, Texas

Vol. 19, No. 8



## Columbia Tile Work Advancing

Application and testing of the thermal protection tiles on orbiter Columbia at the Kennedy Space Center, Florida, is progressing very well.

"We are pleased in our progress and optimistic on meeting our schedule," said Kenneth S. Kleinknecht, JSC vehicle manager at KSC. Workers at the Orbiter Processing Facility have been placing more than 100 tiles a day on the vehicle, the highest rate since the Columbia was delivered to KSC March 1979.

Although there is still more analysis and testing yet to do on the Columbia, Kleinknecht said he is optimistic about completing work on the orbiter early this summer. Some of the testing planned during the next several weeks at KSC include pyro shock test, Mission control center interface test, and crew equipment interface test.

The pyro shock test, now planned for mid-May, is designed to determine the effect live firing of orbiter/external tank separation mechanism may have on the TPS system and onboard avionics. Commands for this separation test will be initiated by astronauts who will be at the controls of the Columbia.

Also in May verification of orbiter on-board radio systems and vehicle software will be performed with the Mission Control Center at JSC. The JSC control center will initiate commands to the vehicle. Purpose of this test is to assess how well spacecraft and ground command control work together.

The crew equipment interface test, also slated for next month, calls for both the prime and backup crews to perform various functions with onboard equipment. This test includes powering up the Columbia and the opening of the vehicle cargo bay doors. This is necessary to complete crew alignment and sighting tests.

Since April 1, 1979, when TPS tile application and testing began, workmen at KSC have bonded more than 19,000 tiles and proof tested close to 16,000 tiles.

## Albatross arrives Big attraction at JSC

The Gossamer Albatross, the bantam weight clear plastic aircraft that crossed the English Channel last June, has become a big and popular attraction since being placed on public display at JSC's Bldg 9-A.

More than 1,000 visitors have been filing through Bldg 9-A daily since the Albatross was put on display. Bldg 9-A visitors had been averaging about 200 to 300 prior to this so reports Charles A. Biggs, Chief of PAO's Public Services Branch.

The 70-pound pedal-powered plane makes a unique sight as it hangs above the Space Shuttle mockups and trainers in the high bay area of 9-A. It will remain on public display, 7 days a week (9 a.m. - 4 p.m.) through April 28 when it will be moved to its next stop of a national tour.

The Albatross has a wingspan of 96 feet (more than a DC-9). Its fish-shaped fuselage is made of clear fibers and films. The craft can fly 10 m.p.h. under optimum conditions (less than 4 knot winds) at 10-15 feet above the ground.

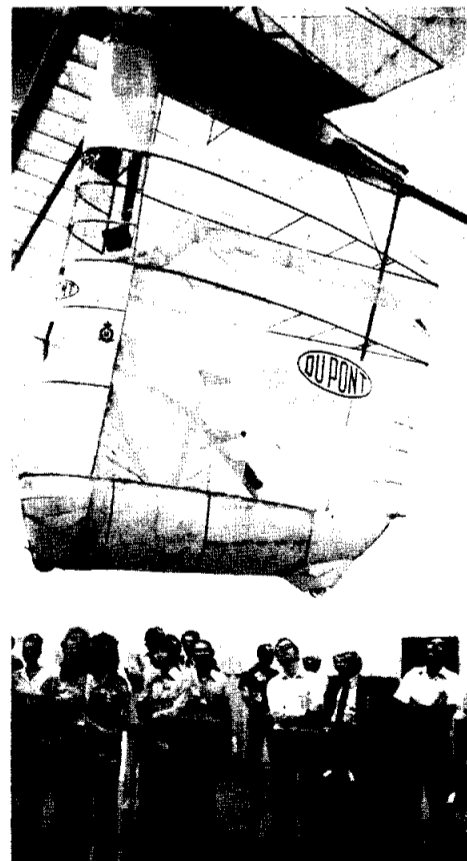
NASA has just completed a month of tests with the Albatross' sister ship at

Dryden Flight Research Center at Edwards, California. NASA's Langley Research Center in Hampton, Virginia, manages the project.

NASA is studying the craft's unique aerodynamic traits, conducting research on the Albatross' low speed flight at low Reynolds numbers. Attitude, speed, mass, and turbulence are important factors in the tests, as is the craft's apparent mass effect, the displacement of air it causes in flight.

At Dryden, the craft flew test flights with different power sources—motor power, cycle power, and towing. Goal of the study is to learn more about the craft's maneuverability and to define and predict its performance under varying conditions.

Bryan Allen who pedaled the Albatross across the English Channel in June 1979 was on hand, along with JSC center director Dr. C. C. Kraft, for the opening ceremonies at JSC on April 3. Dr. Paul MacCready, winning designer of the craft, spoke to a gathering of 450 JSC employees in the main auditorium on April 15.



## STS-1 Sim Set

Flight controllers, engineers and astronauts at the Johnson Space Center will participate in a 54-hour mock flight of the Space Shuttle Orbiter Columbia beginning on Tuesday April 22.

Over 500 people will be involved in the "flight" including—for the first time—Shuttle Program Office and prime contractor representatives.

Launch time is 8 a.m. CST, and landing is scheduled for 2 p.m. on Thursday for this simulation.

Flight Directors Neil B. Hutchinson, Charles R. Lewis and Donald R. Puddy with their teams of flight controllers will monitor Orbiter systems from the Mission Control Center.

Astronauts Joe H. Engle and Richard H. Truly will be performing tasks such as

navigation, startracking and stowage in the Shuttle Mission Simulator. Engle and Truly are the backup crew for Columbia's first flight.

A previous simulation, 30 hours in duration was conducted in January. According to M. P. Frank, Chief, Flight Control Division, "this sim has been extended to 54 hours—full duration of Columbia's first mission—to gain a more realistic response from the flight controllers."

"The simulation is designed to bring together and verify all aspects of the flight," says Frank.

Another 54-hour simulation is scheduled for early June and several more are planned before Columbia is launched late this year or early next year.

## Test Abort at NSTL

A planned 10-minute test of the Space Shuttle main engine cluster was automatically terminated after about 5 seconds last Wednesday (April 16) when a high pressure fuel turbopump overtemperature caused engine #2 to shutdown. There was no apparent damage to the engines or test stand as a result of the shutdown.

For this test, number nine in the Main Propulsion Test series each engine was planned to have different shutdown times had all gone well. Engine #1 was scheduled to fire for eight minutes; engine #2, which suffered the problem

was to have shutdown after 565 seconds of firing and engine #3 was to fire for slightly less than 10 minutes (591 seconds). There have been three previous successful full-duration mission launch profile tests.

Evaluation of test data is underway at the test site, the National Space and Technology Laboratory at Bay St. Louis, Mississippi to determine causes of the problem.

The Main Propulsion Test series began two years ago on April 21, 1978.

The next issue of Roundup will appear as scheduled on May 2, 1980. We are sorry for this issue's delay.

## NASA seeks alternate TPS for shuttle

NASA is requesting proposals from private industry for a design study of alternate thermal protection systems for the Space Shuttle orbiter.

The study's results will not affect present orbiter vehicles, but alternative methods will be considered for later application.

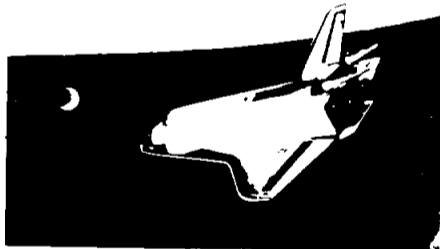
Proposals for the nine-month assessment are due April 28 and the study should begin in late June. It will be managed by NASA's Langley Research Center in Hampton, Va., and is expected to cost about \$900,000.

Major goals of the study are to reduce the costs of the orbiter's thermal protection system and to determine the best available system, whether it is the present one or an alternate one.

The present ceramic system was selected in the early 1970s as the best then available. No detailed assessment of alternate systems has been conducted since that time, however. The new study will bring into focus any recent technological advances in reusable surface insulation.

The study will include evaluation of such types of thermal protection systems as metallic and reinforced carbon/carbon concepts, which are considered probable alternatives. The study will assess potential benefits and problems that might result from alternate thermal protection concepts; establish guidelines to cope with varied loading and conditions and handling, inspection, and maintenance; and identify deficiencies in present technology that may require further research and development.

Roundup deadline is the first Wednesday after publication.



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 all Space Center employees.

Editor ..... Kay Ebeling

## What's cookin' in the cafeteria

### Week of April 21 - 25

**Monday:** French Onion Soup; BBQ Sliced Beef; Parmesan Steak; Spare Rib w/Kraut; Chili & Macaroni (Special); Ranch Style Beans; English Peas; Mustard Greens. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

**Tuesday:** Split Pea Soup; Meatballs & Spaghetti; Liver & Onions; Baked Ham w/Sauce; Corned Beef Hash (Special); Buttered Cabbage; Cream Style Corn; Whipped Potatoes.

**Wednesday:** Cream of Tomato Soup; Cheese Enchiladas; Roast Pork w/Dressing; BBQ Link (Special); Pinto Beans; Spanish Rice; Turnip Greens.

**Thursday:** Beef & Barley Soup; Roast Beef w/Dressing; Fried Perch; Lasagne w/Meat; Chopped Sirloin; Chicken Fried Steak (Special); Whipped Potatoes; Peas & Carrots; Buttered Squash.

**Friday:** Seafood Gumbo; Fried Shrimp; Baked Fish; Beef Stroganoff; Fried Chicken (Special); Okra & Tomatoes; Buttered Broccoli; Carrots in Cream Sauce.

### Soar Off Into the Clouds On a Clear Spring Day...

NASA FLYING CLUB offers the cheapest way to fly in the Clear Lake area. The club is open to all NASA personnel and contractors and their dependents and relatives. The club is based at Houston Gulf Airport in League City. Rental rates are only \$15 per hour wet for the Cessna 150 and \$20 per hour wet for the Cessna 172. There are two instructors in the club which makes it a convenient and cost-effective way to learn to fly. (Two members, Joe Pineda and John Weyrauch, just obtained their private pilot's certificates.) For more information contact Jerry Haptonstall at x5285 or John Weyrauch at x3110.

### Here's a Chance to Take Out Your Secretary

National Secretaries Week is April 20-26, with National Secretaries Day on Wednesday, April 23. NASA Clear Lake Chapter of the National Secretaries Association (International) will hold a buffet breakfast at the Holiday Inn, Nassau Bay, on April 23, 7:45 a.m., \$5.50 per person. The Secretary of the Year, Phyllis Vanlandingham of Control Applications Incorporated, and all secretaries will be honored. All secretaries, members and non-members, are invited to attend this event. Guests are also welcome. Reservations should be made in advance by calling Elaine Ragan, 483-3937 or Fern Deans, 483-5991.

### Are Your Hands Shaky? Are You Short of Breath?...

May is National High Blood Pressure Month. Screening clinics, open to both civil service and contractor personnel, will be conducted by the JSC Clinic during the week of May 12. Times and locations will be announced via the JSC Announcement System and further details will appear in the next Roundup.

## Correction

The Graduate Program in Human Factors/Cognitive Psychology announced in the last issue is at the University of Houston Central Campus, not at the Clear Lake Campus as reported in Roundup. We regret the error.

# Bulletin Board

### Shuttle Stomp Ticket Prices Slashed

The JSC Exchange Council has voted a large subsidy for the EAA/picnic—the Shuttle Stomp—and as a result, ticket prices have been reduced. Adult tickets are now \$2.50 instead of \$3.50, and children 12 years old and under are \$1.50 instead of \$3. In addition to co-chairs Sandy Richardson and Liz Braunig, major event chairs are Cindy Martin, pre-teen entertainment; the Davis Boys—Larry and Ron—adult entertainment; Gloria Salinas and Kandy Hosea, Special Events; and Monica Kruest, open sports. The picnic is May 3, two weeks from tomorrow at Camp Manison from noon to 6 p.m. Tickets are on sale through April 29 at the Building 11 Store.

### On Sale at the JSC Exchange Store

(Store Hours 10:00 AM to 2:00 PM)

Dean Goss tickets - \$10 single  
\$20 couple (Reg. \$14.50)  
General Cinema tickets - \$2.40 each  
Astroworld tickets - \$8 (Reg. \$9.95)  
Six Flags Over Texas tickets  
\$8 for one day (Reg. \$9.95)  
\$9.95 for two days (Reg. \$14.95)  
Magic Kingdom Cards - Free

### NARFE to Hear Speaker on Harris/Galveston Area Subsidence

Chapter 1321 of the Houston-NASA Area National Association of Retired Federal Employees will meet on Wednesday, May 7 at 1 p.m. in the Clear Lake Park Building, E. NASA Rd. no. 1. Dean Thompson, Director of Information for the Coastal Subsidence District, will discuss the progress made in subsidence control in this area. Visitors are welcome. JOIN NARFE TODAY — DO NOT WAIT UNTIL RETIREMENT. Federal Employees who are 50 years of age or over, with at least 5 years of service, are eligible for membership. The Houston-Galveston Area has 10 chapters and most of them have evening meetings. For information about your nearest chapter, call Paul Vavra at 334-2978 or Bess Ross at 488-1965.

### Barbecue Cookoff Challenge Reissued

Employees in the Photo Technology Division received one response to their Challenge (Roundup March 21) to all JSC divisions and branches to a Barbecue Cookoff. JSC employees at Downey may meet with PTD at Centerpoint, Texas, at a date to be decided. Do you think your area can cook better barbecue than these photographers and California types? Call Tom Winston at x3836 and take them on.



**SPACE BUFFS** - More than 2,000 junior high school students attended a NASA Aerospace Symposium recently in San Antonio where they learned about space medicine, astronomy, solar power and Space Shuttle. They heard presentations by astronauts Terry Hart, Fred Gregory and Judy Resnik during the three day symposium which was held at the Kelly Air Force Base. Top photo astronaut Gregory explains components of Space Shuttle to group of interested students while bottom astronaut Hart signs autographs. The symposium was organized by JSC's Equal Opportunity Program Office in cooperation with the Kelly Air Force Base and the San Antonio School District.



## WSTF secretary outstanding in several jobs

The secretary to the manager of JSC's White Sands Test Facility received the Outstanding Secretary award for February 1980. She works with the Technical Manager and Safety Officer, as well as the Manager, and also acts as Personnel Officer for White Sands.

Francisca Telles "consistently does an outstanding job" say her supervisors. She takes data from dictation, notes, meeting minutes, and discussions, and types it all up so effectively that it is virtually unnecessary for us to proof or to have corrections made," her supervisors say.

"Mrs. Telles continually seeks ways to reduce the administrative burden for technical personnel in the Manager's Office," they said. "She routinely handles requests for special handling of philatelic covers, and most of the requests from the general public for information about NASA programs or WSTF.

"Her knowledge of site policy and procedures allows her to resolve a number of

minor problems on her own," they add. "She does an outstanding job in maintaining the site management instructions. Her ability to get along with people plus her pleasant manner presents an outstanding image of the Manager's office and NASA."

## Star Party at LSI

A public "star party" will be held April 26 to celebrate National Astronomy Day in the Clear Lake area. The event will feature telescopes pointed at the heavens and talks on the latest in astronomy as well as movies and slides.

The star party will be at the Lunar and Planetary Institute on NASA Road One Saturday evening, April 26 between 6 and 10 p.m. Admission is free.

The public will be allowed to view the Moon and the planets through over a dozen telescopes set up by local amateur astronomers on the Institute's front lawn.

Inside, starting at 8 p.m., two top astronomers will give talks. First, Steven Croft of the Institute will lecture on "Cratering in the Solar System." Then, NASA's Jeffrey Warner will reveal results of the recent Voyager probes to our largest planet and its satellites as he speaks about "The Worlds of Jupiter."

Films starting at 6 will depict the flights of Apollo 8 and 11 and unmanned flights to the planet Mars. A slide show will present photos taken by NASA probes to Jupiter and Saturn.

National Astronomy Day began in 1973 as a way for both amateur and professional astronomers across the country to entertain and educate the public each year to increase popular awareness of their science.

The star party is being organized by JSC's Astronomical Society, the Houston Astronomical Society, and the Lunar and Planetary Institute.

For further information contact Don Halter at x2213.

## Water egress training

Prime and backup flight crews for the first Space Shuttle orbital flight went through emergency water landing training April 16 at the USAF Water Survival School, Homestead AFB, Florida.

John Young and Bob Crippen, prime crew for the first orbital flight, and backups Joe Engle and Dick Truly, attended an abbreviated version of the Air Force class on survival in water landings after ejection from disabled aircraft.

Shuttle orbiter *Columbia* is fitted with crew ejection seats for the first four orbital flights. Orbiter crew couches will replace the ejection seats when the Shuttle system becomes operational.

After liftoff and until reaching an altitude of 80,000 feet, orbiter crews in an

emergency can eject from the spacecraft. Crewmembers would descend on personal parachutes to the Atlantic Ocean and board one-man liferafts attached to their parachute harnesses.

The Water Survival School course includes towing students in a parasail behind a boat, releasing the towline at 500 feet altitude, descending to a water landing, and inflating and boarding the rafts. The four Shuttle astronauts wore Air Force high-altitude pressure suits which are similar to the suits to be worn in the first four orbital flights.

*Columbia's* first orbital flight, with Young and Crippen as crew, is planned for later 1980 or early 1981.

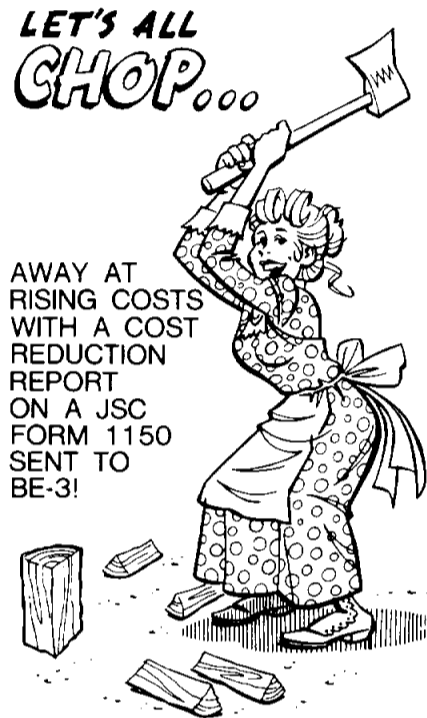
## Canadians sign NASA contract

The NASA Johnson Space Center has signed a contract with Canadian Commercial Corporation of Hull, Quebec, covering production of three remote manipulator systems for the Space Shuttle Orbiter.

Valued at \$63,640,000, the cost-plus-fixed-fee contract will be 100 percent subcontracted to Spar Aerospace Ltd. of Toronto, Ontario. The contract formalizes a letter contract issued May 1, 1979.

The remote manipulator system is a 50-foot long jointed arm operable from within the crew compartment to deploy or retrieve payloads in space.

A 1975 memorandum of understanding between NASA and the Canadian National Research Council provided that Canada would build the first manipulator flight unit at no cost to NASA. Additional flight units would be bought from Canada under the agreement.



Cartoon by Russ Byther

# Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP3 Roundup, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

### Property & Rentals

Lake Livingston lot, restricted subdivision pool, tennis, boat ramp, trees, water, etc. \$2440 will finance, Ward x5971.

Friendswood, 4-2 1/2-2, 1 acre, horses OK, no flooding, owner financing, \$89,900. Barne x3611 or 482-1539.

Sale: Country club lot at Lago Vista Estates on Lake Travis near Austin. Class A resort, golf, tennis, marina. Sacrifice. Steve x3561.

Rent: Jamaica Beach cottage, \$210/wk, two bedrooms, one bath. Make reservations now for summer season. 334-1640 after 6.

Galveston, West End. 2 bdrm, By-the-Sea condo, furn, \$210/wk off, \$300/wk in season. Clements 474-2622.

Sale: Lot on Lake Livingston, nice for building, \$4900 - owner will finance at 10%. Must sell. D. Long x3458.

Lake Houston waterfront property, owner will finance or trade, \$10,000. 487-8633.

Sale: 40 acres overlooking Table Rock Lake in Stone County, Missouri. Beautiful view, heavily wooded. Will sell all or part. x5954 or 482-5952.

Sale: Luxurious waterfront condo; 2-2; large balconies; fireplace; pool; 2-car garage; washer/dryer; compact; 1343 sq.ft.; owner financing. 333-5628.

Rent: Lake Livingston, Cape Royale, complete home, 3-2-1, fishing, hunting, tennis, golf, etc. Reserve early, wk/mo/yr rates. 488-4487.

Lease: Seabrook, Miramar, 3-2-2, drapes, store, dishwasher, carpeted, fenced, near schools and shopping. \$425/mo plus deposit. 333-5883.

Rent: Lake Livingston, Cape Royale 3 bdrm waterfront cottage by marina. Tennis, pool, golf, boat ramp, by week. 488-3746.

Lease: Sterling Knoll, 4-2-2, fireplace, bi-level, \$450/mo. Available now. 481-8637.

### Cars & Trucks

Honda Accord 5 speed hatchback, A/C, AM/FM, \$4000. 488-6420 after 6.

79 Chevy Bonanza Big 10, V-8, AC, PS, PB, saddle tanks, x4857 or 937-0679.

80 Toyota pickup, 5-speed, blue with white pin stripe, 5000 mi, reduced to \$4850. 488-1326 after 5.

73 Pinto low mileage, one owner, good condition, auto, A/C, \$850. 488-4069.

78 Cadillac Coupe de Ville, exc cond, light

blue/dark blue vinyl top, leather interior. 734-4058 after 5.

78 T-bird, t/top, loaded, low mileage, 5 year warranty. Linda x2536 or 479-4463.

75 Thunderbird, loaded, including power windows and custom AM/FM stereo tape, less than 50,000 miles. B. Morris x5293 or 481-3900.

78 Camaro LT, maroon, one owner, power brakes, steering, A/C, auto, good cond, bargain at \$4700. Peacock x2208 or 486-0159.

74 Subaru GL 2 door coupe, manual, A/C, high MPG. Jeff x7429 or 482-5393 after 5.

### Household Articles

Carpet piece 10'x10', red/orange shag. Signature zig-zag sewing machine in table. Andy 488-4366.

Solid pine 32x78 hand carved Spanish door \$75; four new solid birch butcher block chairs \$11 each; twin headboard 58 in high, John 488-0559 after 4.

Built-in Hotpoint dishwasher, coppertone front, one year old, \$150. 482-8781.

Baby bed and mattress (hard rock maple) \$35; Early American sofa, \$35; matching chair, \$15. Lyn Amann 488-5587.

Wards 24 cu ft gold 3-door refrigerator/freezer with icemaker, 7 years old; GE washer/dryer, 6 years old, all currently in use, make offer. 485-3383.

Contemporary desk \$50. Pine and formica kitchen table \$25. x4344 or 333-5254.

5' Kimball baby grand, exc cond, less than 2 yrs old was \$4300, will sacrifice for \$2150 or best offer. Gunter Samionski 471-1914.

GE refrigerator side by side, 21.6 cu ft, ice dispenser, avocado, new compressor, exc cond. \$545. 488-1243.

Bumper pool table, \$125. 488-1326 after 5.

### Pets

Belgian sheepdog, male, 10 months, needs family or individual to love. Sharon x4941 or 481-8479.

AKC Boxer puppy, female, 6 months old, good pet/protector. Ken x6261, Carol x2408 or 334-2397 after 5.

### Wanted

Camper-trailer for use June 5-28; prefer to rent. Would consider purchase. F. Malone x3216.

Small two wheel covered utility trailer. Levan x3670.

Exercycle. Herb x3103

Housing or bedroom accommodations for summer ASEE faculty fellows. Mid-June through August. Nancy Robertson x4724.

### Boats & Planes

14' aluminum boat, 33 hp Evinrude, elec start, McLain trailer, swivel seats, depth finder, trolling motor, never in salt water. 645-6267 evenings.

Hydrodyne 18' ski boat, \$2500 or trade. 487-8633.

Glassmaster '74, 18 ft 188 Merc V8, 2 12 gal tanks, trailer, under 90 hrs on motor, \$3,000. 331-8665.

### Stereos & Cameras

JVC integrated stereo amplifier, 80 watts RMS/Channel, \$150. 484-2067 after 5.

### Musical Instruments

Twelve string Alvarez guitar (needs new strings). Andy 488-4366.

### Miscellaneous

Garage Sale: 4/24-26, 1419 Ramada (rear H/H goods, w/m clothes, antique crystal, pottery, china, miscellaneous. 9-4:30.

Ray Jefferson depth finder, self contained batteries. J. C. Waite x4241 or 333-2442.

22-inch self-propelled mower w/grass catcher, 3 1/2 HP B&S \$50. Thompson x4823 or 332-2229.

Utility trailer, Sears one wheel type with lockable cover. Great shape, great for camping, hauling supplies, etc. \$125. x2392 or 488-0266.

30 gal aquarium w/wooded stand, Dynaflo & silent giant filters, cover, etc. \$65. Bike rack for car \$12. 488-0228 after 5.

Diamond ring, ladies solitaire, 8k diamond in yellow gold mounting. Also small girl's promise ring. Paul Richardson x4205 or 337-4748.

Bay Area Racquet club, single membership. Jane Lehman x3954.

Concrete patio table/2 benches, \$50 u-load. Camper top, sm p/u, \$100. 471-5161 after 6.

All metal utility trailer, 6x4 ft, fitted metal top, good condition, \$235. Bernard x4461 or 333-2968.

Wards "Power Kraft" 3-hp, 20 in rotary mower, newly refurbished and retuned, extra

blade, exc cond. \$55. Ed 333-4119.

VW carburetor-Solex model 34 PICT-3 for 1968-1974 VW, \$50. Air horns-Fiamm series 2000, \$15. Rebuilt starter for 1958 chev, \$35. x4643 or 921-7212.

Kenwood KA-8100 int. amp. 75 w/ch, versatile tone cntrl, in warr. prfct, \$250. Yamaha CT-400 FM/AM tuner, wall case, prfct, \$135. 488-3966.

Craftsman lawnmower self propelled, 22" 3 1/2 hp runs needs work on throttle, manuals included, \$35. 482-8940.

30-06 Winchester rifle, bolt action. Free backyard metal storage shed -you haul it - Andy 488-4366.

Complete set of lifting weights, \$20. Brown 9x12 rug, \$20. Beige, floral design 5x9 hooked rug, \$25. York x6247 or 488-2188.

10x13 Coleman oasis 6 man tent, perfect cond, \$100. AMF 5x10 professional gymnastic mat, \$90. John x4393 or 488-0559 after 4.

Scuba diving wet suit for sale or trade, \$100. Tires -2- A70x13 bias ply, \$20. 487-8633.

Auto air conditioning service and repair. 488-5162 for appt.

### Carpools

2 riders needed for carpool from Alameda Mall area to NASA, 7:30-4. Frank Rodriguez x5203 or x6449.

Need a couple more carpoolers from Friendswood area to NASA; non-smokers, hrs 7:30-4. Brenda x3836.

Want to join/form carpool from Nassau Bay to Herman Hospital 7:30-4, female, non-smoker. 333-2395.

Need another rider from Alameda Mall area, 7:30-4. F. Rodriguez x5203 or x6449.

### Personals

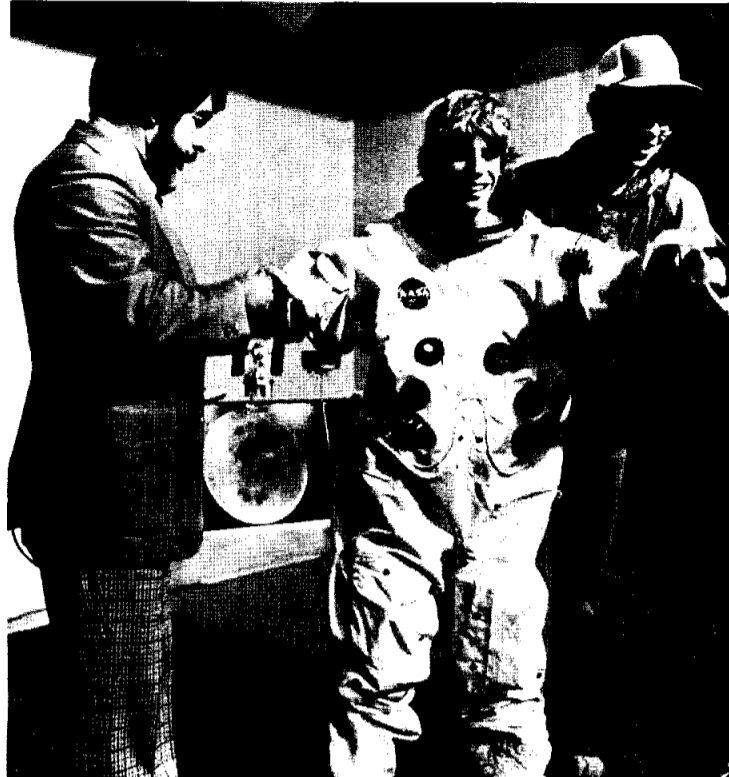
Bible study groups: Want to examine or test a new game for adults about Revelation? Call Tim Kreiter x6450.

### Cycles

76 Honda 750. 945-2573.

JSC Tennis Club is holding an open doubles tournament/Men's, Women's, and Mixed, April 25, 26, and 27 at the BARC. Interested players contact Gresh Downs, 488-0910 x 413(w) or 334-1990.

# SIGHTLESS TOUCH SPACE



Eighty California children, all of whom are either partially or totally deaf or blind received special treatment during a recent tour of JSC. All students of the Foundation for the Junior Blind, Los Angeles, CA., the boys and girls spent the day learning about space. They received a space science demonstration by Jim Poindexter of Public Affairs and were treated to a tour of the Mission Control Center. Judy Resnik briefed the students on the Space Shuttle, while a sign language teacher translated the talk to the students. Those who could not see were able to touch and feel various spacecraft models and other related space hardware, including simulated lunar rocks and geological specimens. Dr. Norman Kaplan, executive director of the Foundation for the Blind relayed the students' impression after the JSC stopover.. "it was the highlight of their whole trip from California," he said.

