



# ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS

VOL. 16 NO. 2

Friday, January 21, 1977



SPACE SHUTTLE DIPLOMACY — His Excellency Huang Chen, right, chief of the U.S. Liaison Office of the People's Republic of China, listens intently as an interpreter translates an explanation of the Orbiter by Astronaut Chief John Young, left. Huang, who served as first ambassador to France from the People's Republic (1964-73), visited JSC Jan. 6.

## Johnston assumes directorship of new Space & Life Sciences

Richard S. Johnston has assumed the new post of director of Space and Life Sciences following the merger of the Science and Applications and Life Sciences directorates at JSC.

Peter J. Armitage is new assistant director for plans and programs. Dr. Lawrence F. Dietlein is assistant director for life sciences and Dr. Owen K. Garriott is assistant director for science.

The new organization absorbs the five divisions in the former di-

rectorates: Science Payloads Division, Space Research and Operations Division, Bioengineering Systems Division, Earth Observa-

tions Division and Lunar and Planetary Sciences Division.

Johnston, 50, began his federal service in 1946 at the U.S. Naval Research Laboratory as a research chemist. He transferred to the U.S. Navy Bureau of Aeronautics in 1955 where he worked on aircraft liquid oxygen breathing systems and low-altitude escape systems.

Johnston transferred to the NASA Space Task Group at Langley Field, Va. in 1959 as an environmental control system engineer on Project Mercury, later becoming chief of the Manned Spacecraft Center (now JSC) Crew Systems Division.

He was named special assistant to the center director in 1968 and managed the Apollo Lunar Quarantine Program and the preparation and operation of the Lunar Receiving Laboratory.

He was appointed deputy director of Medical Research and Operations in 1970, and became director of Life Sciences in 1972.

He joined the Bunker Ramo Corp., Oak Brook, Ill., in January 1976 as special assistant to the president, but returned to JSC and federal service in the fall of 1976.

"I enjoyed my brief stay in industry," said Johnston, "but I missed JSC, its people and the broad spectrum of scientific and technical problems we encounter in the space program. The new directorate will be a challenging job for me professionally, and I feel that JSC will receive many benefits from pooling its limited resources into a stronger science organization."



Richard S. Johnston

## Outstanding individuals, groups receive annual Honor Awards

Outstanding work of 36 individuals and eight groups was recognized last month with the presentation of the 1976 JSC Honor Awards.

Center Director Dr. Christopher C. Kraft Jr. made the presentations, which included 11 Certificates of Commendation, the highest award JSC can give.

The following persons received Certificates of Commendation:

Archie R. Beckett, White Sands Test Facility, for leadership and technical skill in managing the mechanical and facilities systems at WSTF and for achievements as site activation manager for Shuttle testing.

Edison M. Fields, SR&QAD, for contributions to planning and implementation of safety, reliability and quality assurance activities for U.S. manned space flight pro-

grams.

Bruce B. Johnson, Flight Simulation Division, for leadership and skill in managing development and procurement of the Shuttle Mission Simulator Computer Complex.

(Continued on page 2)

## Crew escape system works safely in test

HOLLOMAN AFB, N.M. — Two instrumented dummies parachuted "safely" to the ground here Jan. 11 in a successful test of the Space Shuttle Orbiter's crew escape system.

The dummies, attached to ejection seats in a mockup of the Orbiter's upper crew compartment, were shot 300 feet into the air where individual parachutes were deployed.

The test was conducted for NASA on Holloman's high-speed

test track by the U.S. Air Force's 6585th Test Group. It was the fourth in a series which began in December.

The Jan. 11 test was a static firing in which the crew compartment mockup remained in a fixed position.

The next test, scheduled in early February, calls for the cabin section equipped with ejection seats and dummies to be propelled along the test track. The escape system will be activated while the test article is traveling at speeds up to 438 knots (about 504 mph).

The crew ejection system, seat and parachute system, will be aboard the Orbiter later this year during the Approach and Landing Tests (ALT) at the NASA Dryden Flight Research Center.

The static test was designed to verify the capability of the escape system to provide safe crew escape and recovery while the Orbiter is atop the 747 on the ground.

Subsequent dynamic tests will determine the effectiveness of the system during inflight phases of the ALT program and during launch phases of Shuttle before the Orbiter reaches the altitude of 75,000 feet.

## NASA, Rockwell sign supplemental contract

NASA has signed a supplemental agreement to the Shuttle Orbiter contract with Rockwell International, Space Division. Value of the procurement action is \$10,031,250.

This agreement incorporates nine contract changes previously authorized by NASA for configuration change to the Orbiter for the

Approach and Landing Test, changes in definition of a quarter scale ground vibration test model and additional simulation efforts to cover support of Orbiter 102, the first Orbiter to be launched into space.

This supplemental agreement brings the estimated value of the basic Shuttle contract to \$3.038 billion.



SHUTTLE SEPARATION STUDIES — A test facility craftsman at the Air Force Systems Command's Arnold Engineering Development Center (AEDC), Tenn., conducts a pre-test check of the dual support system which controls the separa-

tion of the two spent Solid Rocket Boosters from the Space Shuttle Orbiter and its External Tank. AEDC is conducting separation tests of the recoverable and reusable boosters for JSC. — USAF-AEDC Photo

### Shuttle calendar

Following are upcoming highlights of the Approach and Landing Tests for Orbiter Vehicle 101, the Enterprise, at Edwards AFB, Calif.:

Feb. 3-4 — flight readiness review

Feb. 14 — taxi tests

Feb. 18 — first captive inert flight; unmanned Orbiter flown piggy-back atop 747

May — first manned captive flight; manned Orbiter flown atop 747

July — first manned free flight; Orbiter separates from 747 and lands at Edwards AFB



COMMENDATION RECIPIENTS — Shown here with Center Director Dr. Christopher C. Kraft Jr. are nine of 11 persons who received Certificates of Commendation at the 1976 Honor Awards. They are Edison M. Fields, Bruce B.

Johnson, John W. Kiker, William A. Larsen, Richard U. Perry, Andrew E. Potter Jr., Richard G. Snyder, Carrington H. Stewart and Sidney L. Whitley. Not pictured are Archie B. Beckett and James R. Miller.

## Outstanding individuals, groups receive annual Honor Awards

(Continued from page 1)

John W. Kiker, Spacecraft Design Division, for proposing the concept and performing engineering studies that led to the decision to use a carrier aircraft to transport and flight test the Orbiter.

William A. Larsen, Logistics Division, for leadership in managing the development and implementation of an effective Equipment Management Program for JSC.

James R. Miller, JSC-Downey, for leadership and skill while project leader of Palmdale Quality Assurance, Reliability and Safety Operations in support of the Orbiter project.

Richard U. Perry, Quality Assurance Division, for contributions to the development and operation of the problem reporting and corrective action system for the Shuttle program.

Andrew E. Potter Jr., Science Payloads Division, for leadership in managing the Shuttle Environmental Effects Project Office and for contributions to understanding Shuttle interactions with the tropo-

spheric and stratospheric environment.

Richard G. Snyder, Flight Simulation Division, for leadership and skill in managing development and procurement of the Orbiter Aero-flight Simulator.

Carrington H. Stewart, Tracking & Communications Development Division, for leadership and skill in managing design and development of low-cost, high-performance audio systems for the Orbiter.

Sidney L. Whitley, Earth Resources Lab-Slidell, for leadership and skill in managing development of cost-effective data management systems contributing to application of remote sensing technology to environmental and natural resource management problems.

Superior Achievement Awards were presented to JSC employees Ronald K. Bliie, Roscoe Breeler, O. Constance Critzos, Thomas W. Davis, Samuel P. Gibson, Susan M. Gregory, S. David Griggs, Forrest G. Hall and Richard F. Hergert.

Also to Mary Y. Kerr, Richard H. Koos, Clyde L. Lowrimore, M. Conley Perry, George F. Prude Jr.,

Millard F. Reschke, Dolores F. Rodriguez, Clyde O. Waters, Robert P. Wilson and Judith S. Wyatt; and to White Sands employees Albert A. Duran and John A. Mathis.

Herbert E. Rihn was presented the Equal Opportunity Award.

Group Achievement Awards recipients and the names of the individuals who accepted the certificates were: Balloon-borne Ultraviolet Stellar Spectrometer Team, Yoji Kondo; Environmental Effects Project Team, John F. Stanley, and JSC Telephone Switchboard Operators, Helen H. Ragsdale.

Also the Operational Orbiter Seat Team, Chris D. Perner; Orbital Maneuvering System KC-135 Flight Test Team, John D. Norris and Robert K. Williams, and Skylab Experience Bulletin Team, Robert L. Bond.

Certificates of Appreciation went to Mary Kotanchik, Exchange Store manager; Jimmy D. Murphy, Agricultural Stabilization and Conservation Service; Diane Y. Townsend, Boeing Aerospace Co., and Pan American's Aerospace Services Division.

The awards ceremony was held Dec. 15 in Room 966, Bldg. 1.

The following day, Center Deputy Director Dr. Sigurd A. Sjoberg presented a special Group Achievement Award to the Space Shuttle Wind Tunnel Coordination Panel. James C. Young of JSC, chairman, accepted the award.

## ENERGY exhibit reopens

ENERGY, the traveling exhibit of the Energy Research and Development Administration, has reopened on the parking lot of Bldg. 14.

The free exhibit, housed in two 50-foot trailers, will remain on display at JSC through Jan. 31.

Various types of current and future energy sources are presented.

## Curtis Graves gets NASA HQ position

Former Houston State Rep. Curtis M. Graves has been named director of the Community Affairs Division at NASA Headquarters, Washington, D.C.

In this position, Graves reports to the assistant administrator for Public Affairs.

Graves' office is concerned with promoting understanding of NASA's economic and social impact on areas surrounding its installations. Toward this end, Graves said, he will assist in informing communities of agency services and facilities available to the public.

Graves said he will be asking NASA centers to designate a community affairs coordinator to aid in carrying out these responsibilities.

Before joining NASA, Graves was managing associate for continuing education and administration for the National Civil Service League from 1973-77.

Prior to that, he served six years as a member of the Texas House of Representatives. In 1966, Graves was the first black elected to the Texas Legislature since 1891.

He has held positions with two Houston newspapers and acted as comptroller and branch manager of a savings and loan association.

Graves earned his bachelor's degree in business administration from Texas Southern University. He was awarded an honorary doctorate from Union Baptist Bible College.



Curtis M. Graves

## Cheryl Jack chosen January JSC co-op

Cheryl A. Jack, a senior at Texas Southern University, has been named JSC's Co-op of the Month for January.

Jack is a business education major assigned to Institutional Procurement Division at JSC. This past term was her fourth assignment here.

Donald B. Cherry, chief, Technical Support Procurement Branch said, "Cheryl has developed into a

first-rate employee. She has grown steadily in her assignment of administering cost type contracts and grants from acceptance to retirement.

"Cheryl's performance this past term has been excellent," Cherry added. "She is invariably up-to-date on a growing number of assignments and her purposeful approach in dealings with outside offices has been effective beyond our expectations."



HOW'S YOUR EQ? — These young women are testing their EQ's (Energy Quotients) on one of the consoles at ERDA's ENERGY exhibit now on display on the Bldg. 14 parking lot. The quiz asks visitors questions such as "How much of the gas used in gas stoves supplies the pilot lights?" For the answer, visit the exhibit.

## Civilian astronaut applicants total 1,047

The Astronaut Candidate Program Office reported Jan. 14 that 1,047 applications have been received for civilian astronaut pilot and mission specialist candidate positions. Of those applicants, 118 are women.

Of a total 11,530 applications

and announcements mailed out by request, 209 went to JSC employees.

Civilian applications must be postmarked no later than June 30, 1977. For information, write the Astronaut Candidate Office, Code AHX.

## ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

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: Richard Finegan

Photographer: A. "Pat" Patnesky

Friday, January 21, 1977

# Hospital requests aid of JSC's Blood Bank

St. Luke's Hospital, which backs the JSC Blood Bank program, has issued a call for help in replenishing blood supplies which were almost depleted during the holidays.

In response to the need, Blood Bank Chairman Helon Crawford is encouraging JSC and contractor employees to give blood at the next on-site drive, Jan. 25, even though that drive was scheduled primarily for McDonnell Douglas employees.

Any donor wishing to give blood at that time should call Jane McFaddin at McDonnell Douglas, 488-5660, X-225, for an appointment. The drive will be held at the Gilruth Recreation Center, Bldg. 207.

St. Luke's Hospital provides the JSC Blood Bank with the best coverage of any blood insurance program in the Gulf Coast area, Crawford said.

Donation of one unit of blood insures the blood needs of the donor, his or her immediate family,

parents, mother-in-law and father-in-law for 12 months from the date of donation.

Although JSC and contractor employees may give blood at any scheduled drive, the next one aimed primarily at government employee donors is set for Feb. 17. For appointments for that drive, call Bob Jones, X-3271.

# Feminist author Greer to speak at UHCLC

Feminist Germaine Greer, author of "The Female Eunuch," will be keynote speaker during the University of Houston at Clear Lake City's observance of Women's Week, Jan. 31-Feb. 4.

All JSC employees have been invited to participate in the week's events. Greer's speech will be on the night of Feb. 4 and there is an admission charge.

## CIRCUS VARGUS

It's a full three-ring circus, under-the-Big-Top fun for the entire family and the EAA has free tickets available for all children under 11 years.

Pick up the freebies at Bldg. 11 or they'll cost you \$3 at the gate. Adult tickets are \$4.75 but you don't have to accompany your kids to get them in. The Circus Vargas

Other highlights of the observance include a series of mini-workshops conducted by Dr. Nikki van Hightower, a showing of the film "Diary of a Mad Housewife" and a panel discussion on career opportunities.

For additional information or reservations, contact Mary Kerr, X-4831.

will be at Memorial City Shopping Center through Jan. 23, then at Gulfgate Mall, Jan. 27-31.

## RODEO TICKETS

The EAA has acquired a large block of tickets to four performances of the 1977 Houston Livestock Show and Rodeo.

All tickets are \$5.50 each. Headlining performers and dates are: Mac Davis, Feb. 26; Mel Tillis, March 1; the Osmonds, March 5; and Charlie Pride, March 6 (matinee).

## OTHER TICKETS

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

**Houston Aeros** - EAA discount gift coupons may be exchanged at the Summit box office for "live" tickets on the night of the game. A \$6.50 coupon gets you an \$8 ticket, \$5.50 gets a \$7.50 ticket and \$4 gets a \$5 ticket. Aeros play St. Paul, Jan. 21; San Diego, Jan. 23; Winnipeg, Jan. 25; Calgary, Feb. 1; and Birmingham, Feb. 4.

**ABC Interstate Theaters** - \$1.50 admission tickets.

**Dean Goss Dinner Theater** - Comedy production, *The Babysitter*, starts Feb. 23, \$16/couple. Tickets available every night except Monday, Saturday.

**Disney Magic Kingdom Club** - Free membership cards. Also available is Disneyland passport, good any day through May, which allows unlimited use of all Disneyland attractions. Adults, \$7.50; juniors, \$7; children, \$6.

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

**Marietta's Dinner Theater** - Royal Coach Inn, Southwest Freeway. Tickets \$5/person any night. Call Ms. Royal, 621-5957, tell her you're from JSC. Get ticket and pay at theater on night of play.

## COUNTRY-WESTERN DANCE

The EAA's first 1977 C&W Dance is scheduled for Feb. 19 at the Gilruth Recreation Center. Tickets are \$8/person and include drinks. The band calls itself "Albatross." Ancient mariners beware.

## NEW DANCE CLASSES

Wednesday night ballroom dance classes begin Jan. 26 at the Gilruth Center. You may register at 6:30 or 8 p.m. Cost is \$37/couple for 10 weeks. Rae & Bob Calvert are instructors. For information, call Bill Simon, X-4027.

# NASA-wide fire loss record set

NASA's fire losses for fiscal year 1976 set a new low record for the agency of only \$41,000 in damages.

Agency Administrator Dr. James C. Fletcher sent memoranda to all center directors commending them for their part in keeping the losses so low.

"Considering the nature of our activities, operations, facilities and missions, this is an accomplishment in which we can take great pride," Fletcher said.

JSC Safety Division showed four minor fires here during fiscal 1976 with total damages of only \$1,140.

# 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

71 Camaro. Gold, 4-spd, pwr, needs some body wk. below list. 482-7715 after 5.

69 Chrysler New Yorker. Full pwr & elec, good cond. \$500. Sands, 332-4692 after 6.

68 Chevy Malibu. V8, 2-dr, air, good wk car. \$450. Gaventa, 481-0523.

72 Pont LeMans Sport. 2-dr HT, Bukts, console, air, PS, loaded, xint cond. Dk brown w/beige vinyl top. Sam, X-2553.

70 Olds F-85 Cutlass. 53K mi, new steel radials & batt, air, radio/tape, xint cond. 946-0111 after 6.

74 Honda Civic Hatchback. Auto, air, xint cond. \$1,695. Bullock, X-3681 or 488-1042.

68 Chevy Pickup. 6-cyl, stdn. \$600. Bullock, X-3905.

69 Pont 2-seat Sta Wgn. Air, auto, pwr, good tires. 488-4013 after 4.

72 Chevy Vega Hatchback. 4-spd, air, red ext/int. 334-4678 after 5.

77 Chevy Van. 1/2-ton, brand new, no miles, air, pwr. \$5,384. Allgeier, 474-3961.

72 Chevy Malibu. 4-dr, 302, air, pwr str, lots new equip. Clean inside, needs minor paint. \$1,650. 481-1507 after 4:30.

71 Datsun 240Z. Pretty good shape, under Blue Book. 333-2787.

73 Toyota Land Cruiser. Xint cond, 6-cyl, 4WD, 8000 lb. winch, locking hubs, tape player. Doug, X-5557 or 534-2226.

76 Ford F-100. 12K mi, xint cond, sm equity & take over payments. Hector, 477-6624.

72 Datsun Sta Wgn. Fac air, runs good. Schneider, 426-4749.

70 Dodge Van Camper. Sleeps 2 adults/2 child, stove, icebox, sink, 318 eng, pwr str. \$2,000. Scott, X-3278 or 554-6148.

74 Camaro. Midnight blue, fully loaded. 487-1321.

70 Ford LTD 9-pass Wgn. Orig owner, good cond, radio, air, radials. \$795 or best offer. 474-4790 after 6.

73 Chevy Caprice Estate Sta Wgn. Xint, low miles. \$2,300. Smith, 488-3238 after 6.

Mustang parts. 200 cu in, 6-cyl, C4 auto, air, emblems, etc. \$150 for all or sell separate. Tuthill, X-5293 or 487-5044 after 5.

## BOATS & PLANES

14-ft open fishing boat. 1975 35-HP Chrys elec start, trlr, new tires. \$550. 482-1949 after 3.

Fly Tall-Dragger. PA-16 Piper Clipper. 108LYC, 575SMOH, 300 NAVCOM. Ray, X-3071 or 332-5892 after 5.

1969 Beech Musketeer. 4-place, dual drs, MK 12, Escort 110, TPDR, xtras. TTAE 800, TBO 2000, LYC 180, 0-360. July annual. 333-2787, X-6121.

## PROPERTY & RENTALS

Cholce Residential acre lot. Alta Loma addition, Pasadena. 944-3342 after 5.

Surfside beach house. Corner lot, compl furn, lg deck & carport. Good Invest. 485-2627 or 991-5500.

Room for rent w/kitch privs in Lg Cty. Wells, X-5293 or 554-2871.

Mobile home 14X70. Compl furn, cent air/ht, patio cvr. Must sell. 485-2627 or 991-5500.

## PETS

Border Collie pups. Ready at end of Jan. Rainey, X-7272 or 474-2988.

Collie/Labrador retriever pups. Free. 5-wks old. Arndt, X-5973 or 482-3989.

## STEREOS & CAMERAS

2 Acoustic Research-17 speakers. \$80/pr. Lake, X-3286 or 523-2137.

Koss stereo headphones. 727/B, 10-18,000 Hz, new cond. \$20. Mike, X-6257 or 481-0978.

Minoita Hi-matic 7 35mm rangefinder camera, 1.7 lens, xint cond, \$60. Also GAF 2688Z movie projector, shows reg & super 8, all fancy features, like new, \$60. Parmenter, X-5861 or 482-7734.

## HOUSEHOLD ARTICLES

48-in game table w/4 swivel chrs, \$100. Set of Chinese hand-carv teakwd nesting tables w/soapstone, coral, jade top design, \$275. 471-2523.

Green sofa & 3 match chrs. Xint cond. \$300. Sands, 332-4692 after 6.

School desks, formica top, adjust ht, stor compt, w/roller chr. Xint for study or hobby. \$22. Grafte, X-2351 or 783-1694.

Frigidare washer & dryer. White, dryer in xint cond, washer good cond. \$200. 333-3349.

## MISCELLANEOUS

74 Viking tent trailer. Stove, icebox, sink, sleeps 6. Used abt 6 times. \$1,400. Scott, X-3278 or 554-6148.

Gibson B-25 acoustic guitar. Sunburst finish, very good cond, w/case. \$115. Dave, X-4701 or 488-6930.

76 28-ft 5th Wheel travel trailer. Full contained, sleeps 6, \$8,500. With air cond 1974 Intl pickup, \$11,500. 449-2929 or 482-5429.

HP-25 calculator. \$100. Livingston, 334-2369.

2 tires, C78-13 on Mercedes rim, \$13 ea. Wire, 18 ga, abt 1500 ft in 30-ft lgths, \$2 for all. Traller, 5X8X5 covered, 2 axle, military radar excess, \$150. Ward, 488-5445.

Savage 311 20 ga. double bbl shotgun. 26-in bbls, mod & imp cyl, xint. \$75. 488-3966.

Heath-kits. MI-104 depth sounder, \$25. MI-11A thermospotter, \$15. Analog computer, \$100. Pitts, X-6478 or 991-3138.

Family memshp in Racquet Club, discounted. Classic model Polaroid camera from '50s w/leather case, \$59. Boat towbar for water skiing, \$15. Laminated wood O'Brien waterski, \$85. Equipt 16-ft tri-hull boat, new cond, 120HP outbd & trlr, \$2,495. Bland, 333-4580.

Like new 1155, 5-1/2 ft Shakespeare rod & 500-C Garcia reel. \$50. Madeline, 332-2556 or 488-0427 evngs.

Openings avail in Clear Creek Bass Club. Beginners or experts. Inquiries welcome. Whipkey, X-5872, or Holloway, X-5189.

## WANTED

Need overnight teenager-sitter for occasions when I travel. Rainey, X-7272 or 474-2988.

Like to buy used waterskis to fit child, age 10. Cathey, X-2151.

Civil Service men & women volunteers for hypoglycemia study at JSC. Involves taking 5-hr glucose tolerance test. Charlotte Smith, X-4086.

Exercise bike wanted. Childs, X-4776 or 534-6096.

Buy or trade American Flyer or Lionel trains & acces, working or not. 334-3182.

Firefighters needed. Men & women, adult residents of CLC to join CLC Vol Fire Dept. You will be trained & equipped. 488-0023 anytime.

## LATE ENTRIES

Avocado green shag carpet, 12X15' w/padding. \$75. 481-6874.

73 Ford Sta Wgn. \$1,650. Beal, 991-1544.

Galveston, 2 BR full equipt apt in By-the-Sea condo. \$180/wk, off season. \$260/wk, in season. Clements, 474-2622.

CREDIT UNION REPOS: 74 Datsun, 75 Fiat, 75 VW Rabbit, 73 Olds, 75 Trans Am. Cars shown 1/24-1/26. Bids opened 1/27. CU reserves right to refuse all bids. Cars shown by appt, 10 am-2 pm. Call collection dept, 488-7070.

## CARD OF THANKS

The family of James M. Satterfield would like to express their sincere thanks to all those who gave their support by means of telephone calls, cards, etc. during his illness and death. We would like to extend a very special thank you to those employees who donated blood in Jim's behalf. A James M. Satterfield Memorial Fund has been established at the Clear Lake Methodist Church if anyone wishes to make a contribution.

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

# JSC Crossword

## DOWN

- Power switching assembly (acronym)
- Caviar
- Rower
- Apollo-Soyuz was one
- Pioneer 10 photographed it
- Coach Parsaghan
- Vacuum (abbr.)
- Beer
- Sparoid fish
- Actress Lupino
- National Football League
- Kingdom of Lanka
- Intravascular activity
- Over
- Compass point

(See answers, page 4)

## ACROSS

- Propeller
- Coffee
- Glide
- Russ. mountain range
- Atmosphere and above
- al'ai (Basque sport)
- Putting spacecraft into orbit
- NASA facility at Edwards AFB (acronym)
- Equal
- Dismounted
- Infrequent

# Smithsonian displays Pioneer 10 model

An engineering test model of NASA's Pioneer 10, the first spacecraft to reach the giant planet Jupiter, is now displayed in the National Air and Space Museum of the Smithsonian Institution, Washington, D.C.

Pioneer, which will also become the first spacecraft to leave the solar system, joins Apollo 11, the Wright Brothers Flyer and Lindbergh's Spirit of St. Louis in the Smithsonian's Milestones of Flight Hall.

A dedication ceremony for the new test model exhibit was held at the museum Jan. 10.

The actual Pioneer 10 now is 1.6 billion kilometers (1 billion miles) out, between the orbits of Saturn and Uranus.

The unmanned spacecraft still is reporting new data from unexplored space and should do so as far out as Uranus' orbit, almost 3.2 billion km (2 billion mi.) from the Sun.

Pioneer 10 will reach Uranus' orbit in September 1979, at the same time its sister spacecraft, Pioneer 11, arrives at Saturn for man's

first closeup view of the ringed planet.

Using the newest radio technology and our largest antenna (at Arecibo, P.R.) to direct the craft, scientists may well use Pioneer 10 to "describe" unexplored solar space as far out as Pluto's orbit, nearly 6.4 billion km (4 billion mi.), and perhaps beyond.

Reaching Pluto's orbit in 1987, Pioneer will cross the solar system boundary into interstellar space. From there, it will go on "forever," but eventually unheard from Earth because its signals will become inaudible over the radio background noise of the universe.

Pioneer is headed generally for the red star Aldebaran, the eye of the constellation Taurus. Pioneer will take more than two billion years to reach this point.

Pioneer 10 made the first visit to Jupiter in December 1973 and discovered that the enormous planet is a huge whirling ball of liquid hydrogen with no perceptible surface. Pioneer also returned the first close-up views of the giant planet with its huge red eye.

It made a variety of discoveries about Jupiter's magnetic field, radiation belts and weather. Findings about the latter should help shed more light on the difficult problems of Earth's unstable weather and climate.

Pioneer 10 was launched on March 3, 1972, and made the first flight beyond Mars and through the asteroid belt, dispelling theories

about an asteroidal barrier to outer planet exploration.

Mission planners used Jupiter's gravity to hurl the spacecraft on an escape trajectory out of the solar system. It crossed Saturn's orbit last February and now is traveling away from the Sun at a speed of 59,200 km (37,000 mi.) per hour. Somewhere in interstellar space its speed will stabilize at just over 40,000 km (25,000 mi.) per hour.

Pioneer 10's twin spacecraft, Pioneer 11 is now making the first trip to Saturn. Pioneer 11 added greatly to Jupiter's knowledge by taking the first look at the planet's polar regions (not visible from Earth).

A few weeks ago, following its Jupiter-Saturn flight path, 160 million km (100 million mi.) above the plane containing the planets, Pioneer 11 discovered the structure of the Sun's magnetic field.

That find may have a major impact on particle physics and on understanding the billions of Sun-like stars in the universe, suggesting a relatively simple internal structure for Sun and stars.



**DOMES DESIGNER** — Architect-designer and educator R. Buckminster Fuller, right, discusses the Orbiter Remote Manipulator System in Bldg. 9-A with Allen Louviere, chief, Spacecraft Design Division. Fuller, 81, was the inventor-discoverer of energetic-synergetic geometry and the geodesic dome. He was in Houston last week for an energy conference at the University of Houston.

# NASA schedules 23 launches for 1977

NASA has scheduled 23 space launches for 1977, beginning Jan. 27.

Of these, 17 launches will be for paying customers other than NASA. They include NATO, Indonesia, European Space Agency, National Oceanic and Atmospheric Administration, COMSAT Corp., U.S. Navy, Japan, Italy, RCA and the United Kingdom.

These customers will reimburse NASA for the costs of the launch vehicles and associated launch services.

The 1977 schedule compares with NASA's 16 launches in 1976 of which 12 were in the reimbursable category.

The 1977 launch schedule also indicates the continued emphasis on using space for the direct benefit of the people on Earth. Seventeen

of the 23 planned missions are in the applications satellite category — communications, geodesic, environmental, navigation, meteorological and Earth resources.

The first 1977 launch will be NATO-3B, a North Atlantic Treaty Organization communications satellite, Jan. 27 from Kennedy Space Center (KSC), Fla. The launch, atop a Delta booster, was originally scheduled in December 1976, but was postponed to provide additional time for testing of the spacecraft at the manufacturer's plant in California.

Palapa-B (Palapa-2 when successfully launched), second of two communications satellites to be launched by NASA from KSC for the Indonesian government, is scheduled for launch on a Delta in March. The satellite will expand Indonesia's domestic communications system initiated by Palapa-1, which is on station over the Pacific Ocean providing television, radio, telephone and data communications between the capital city and Indonesia's 26 provinces.

The first of three High Energy Astronomy Observatories (HEAO), on an Atlas Centaur, is scheduled for launch in April from KSC. Using a combination of charged particle detectors and the Earth's magnetic field as a mass spectrometer, HEAO will separate the isotopes of cosmic rays and obtain information on the origin of the rays and how they are changed as they propagate through space.

GEOS/ESA (Geodynamic Experimental Ocean Satellite-D) will be launched on a Delta for the European Space Agency (ESA) from KSC in April. The satellite will test the effectiveness of newly developed instruments in monitoring ocean topography and observing sea state.

GOES-B/NOAA, a Geostationary Operational Environmental Satellite-B, will be launched on a Delta in May from KSC. The National Oceanic and Atmospheric Administration satellite, carrying improved instrumentation for monitoring weather patterns, will join sister satellites SMS-1, SMS-2 and GOES-1 in geosynchronous orbit.

OTS/ESA (Orbital Test Satellite) will be launched at KSC on a Delta in June. The spacecraft, carrying advanced experimental communications systems, will be inserted into geosynchronous orbit over the equator at 10 degrees east longitude for the European Space Agency.

Intelsat IV-A communications satellite, the first of two launches for the International Telecommunications Satellite Organization, is scheduled in June from KSC. The launch vehicle will be an Atlas Centaur. A second Intelsat launch is scheduled for October.

Navy 19 is the first of two Scout launches from the Western Test Range at Vandenberg AFB, Calif. This and Navy 20, planned for call-up in December, will place navigational satellites in Earth orbit.

## Toastmasters pick Rosales new president

The Spaceland Toastmasters Club at JSC has installed John Rosales as its president for 1977, replacing Ann Sullivan.

The Toastmasters are having an open house through February. All JSC employees are invited to attend their meetings on the second and fourth Wednesdays of the month at 11:15 a.m. at the Bonanza Sirloin Pit, NASA Road 1.

For further information, call Claren Kunert, X-3358.

GMS/Japan (Geostationary Meteorological Satellite) will be launched on a Delta from KSC for the Japanese Space Agency in July. The spacecraft will become the Japanese portion of a global network of environmental satellites.

Sirio/Italy, an experimental communications satellite, will be launched for the Italian government on a Delta at KSC in August. It will be inserted into a geosynchronous orbit at 15 degrees west longitude.

Meteosat/ESA, the ESA's first meteorological satellite, is scheduled for launch on a Delta in August at Kennedy.

Two Mariner Jupiter Saturn (MJS) launches are scheduled at Kennedy in August. The launch vehicles will be Titan Centaurs. The two spacecraft will be instrumented to obtain data on the environments, and atmospheres of Jupiter and Saturn, with emphasis on the latter's rings.

Landsat-C, scheduled for launch from the Western Test Range on a Delta in September, is NASA's third Earth resources satellite to expand worldwide collection of Earth resources data.

The first two of three International Sun Earth Explorers (ISEE), jointly sponsored by NASA and ESA, will be launched on a Delta from KSC in November. ISEE-A is a NASA spacecraft and ISEE-B was developed by ESA. Shortly after

launch, ISEE-B will separate from ISEE-A and become active. The two spacecraft will be inserted into an orbit with an initial perigee of about 1,290 kilometers (800 miles) and an apogee of 23 Earth radii, or about 146,450 km (91,000 mi.).

The ISEE-B spacecraft will be successively maneuvered to fixed distances of about 96,965 and 4,830 km (60,600 and 3,000 mi.) from ISEE-A, remaining in each orbit from one to three years. During their multi-year missions the two spacecraft will investigate solar-terrestrial relationships at the outermost boundary of the Earth's magnetosphere and examine solar wind near Earth and the shock wave which forms the interface between the solar wind and the Earth. ISEE-C is scheduled for launch in 1978.

FLTSATCOM-A (Fleet Satellite Communications-A), the first of five geosynchronous orbiting satellites for a U.S. Navy worldwide communications satellite system, is scheduled for launch on an Atlas Centaur from KSC in September.

CS/Japan, a Japanese geosynchronous communications satellite to provide domestic telephone and color television transmissions, will be launched on a Delta in November from KSC.

IUE-A, a NASA interplanetary spacecraft to measure ultraviolet radiation, is scheduled for launch aboard a Delta rocket from Kennedy in December.

Two more launches are tentatively scheduled for 1977. The first is the UK-6. This high energy physics and astronomy satellite would be launched by a Scout rocket from the Wallops Flight Center, Va., for the United Kingdom. The second is RCA-C, a third domestic communications satellite which would be launched in September if called for by RCA.

## Is all your training on record?

All JSC employees should have received by now a computerized summary of all training which they have received since 1966 as recorded in their personnel folders.

If you have not received such a summary, contact your division or office training coordinator.

If the coordinator has not received a summary of your training, send a memo to Phoncille De Vore at AH3 informing her of that fact so she may assure that such a list will be included on the next computer run.

These summaries are the first attempt to develop a computerized record of training for each employee. They were prepared in 1975 by a group of Summer Aids.

### JSC crossword answers

(See puzzle, page 3)

A	L	I	T						
R	E								
N	E	V	E						
N	O	I	T	R	E	S	E	N	I
				A	I	J			
E	C	A	P	S	O	S	E	R	A
L	R	A	U	R	A	R	O	S	
A	V	J	P	O	R	P			