NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas

Translation, please

The Crew and Equipment Translation Aid has come a long way in a short time and is ready to fly on STS-37. Story on Page 3.

Distinguishing marks

Construction of the orbiter that will bring NASA's space shuttle fleet back to four is about 70 percent complete. Photo on Page 4.

Space News Roundup

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Conference to examine latest lunar, planetary science

By Pam Alloway

Scientists from around the world will converge on JSC next week to discuss the latest research on lunar and planetary science, including preliminary findings from the Long Duration Exposure Facility (LDEF).

About 750 scientists are expected to attend the 21st Lunar and Planetary Science Conference which will feature more than 30 technical sessions on Mars, the Voyager 2 mission, LDEF, and various lunar topics.

There also will be two public sessions—an exploration initiative special session Monday and a special Voyager 2 session Wednesday.

Monday's session on the exploration initiative will feature: JSC Director Aaron Cohen; JSC's Space and Life Sciences Director Dr. Carolyn Huntoon; Acting Manager of JSC's Lunar and Mars Exploration Program Office Doug Cooke; NASA Headquarters' Office of Space Science and Applications Deputy Associate Administrator Al Diaz; and Headquarters' Solar System Exploration Division Director Dr. Geoffrey Briggs.

Wednesday's session, entitled "Voyager II: A Look Back," will feature Dr. Andrew P. Ingersoll, professor and executive officer of planetary science at the California Institute of Technology. The Voyager 2 spacecraft in August 1989 sent back data and images of Neptune, and Ingersoll participated in that encounter. Both programs will begin at 8 p.m. in Teague Auditorium and are free.

Concurrent technical sessions are scheduled each day at 8:30 a.m. and 1:30 p.m. in the Gilruth Recreation Center. On Friday, the conference's final day, sessions are scheduled for 8:30 a.m. and 10:15 a.m.

Registration for the conference will begin at 6 p.m. Sunday at the Lunar and Planetary Institute, 3303 NASA Road 1. Registration will continue throughout the conference on the second floor of the Gilruth.

Scientists and scholars will present about 375 papers during the conference. Technical sessions will cover such subjects as: a Venus overview prior to Magellan; lunar meteorites, geology and resource utilization; cosmic rays; comets and orbital dust collection; the outer solar system; Martian geophysical and tectonic evolution, volcanic evolution, climate histories and craters; solar nebula and planetary origins; heavy metal

Please see **LUNAR**, Page 4

JSC Photo by Bob Walck

Mission Specialist Pierre Thuot gets a hug from his wife, Cheryl, as he is greeted by the crowd at the Ellington Field welcome home ceremony Sunday evening.

Smooth landing caps flight

Atlantis beats out weather for Sunday landing

Atlantis and the crew of STS-36 glided to a smooth noontime landing on an Edwards Air Force Base lakebed Sunday, beating out a front that had threatened to ruin landing weather.

STS-36

The spacecraft completed its sixth flight at 12:08 p.m. CST after a 4 day, 10 hour and 18 minute Department of Defense-dedicated mission that began Wednesday with a spectacular night launch.

"We had a good time, we did something that was important for the country, everything went very well and we enjoyed doing it," said Commander J.O. Creighton during homecoming ceremonies at Ellington Field on Sunday. "We got to go to some places that nobody'd ever gone before."

The landing went smoothly, with the exception of a hydraulic pressure concern in the system feeding auxiliary power unit (APU) 1. The three redundant APUs provide power to drive the orbiter's elevons, rudder/speed brake, body flap, landing gear and brakes during entry and landing.

Ascent/entry Flight Director Ron Dittemore said flight controllers were watching the system because a pressure fluctuation had been noticed during ascent.

Please see ***ATLANTIS***, Page 4

Rockwell wins space station support pact

Rockwell Space Operations Co. (RSOC), Houston, has been selected for the Operations Support Contract (OSC), one of the three largest support contracts at JSC.

The 10-year, $814 million contract is a new effort expected to create about 200 new jobs in its first year and peak in 1995 at about 1,450 employees. If all options were exercised, the contract would total $1.2 billion.

"This is new business to the Clear Lake area, new jobs," said JSC Procurement Director Gene Easley. "The first year it will have 200 people, the second year 300, the third year 700, and the fourth year 1,000. There'll be 1,450 by the sixth year. That's quite a sizeable impact on the Clear Lake area."

The contract for the Mission Operations Directorate (MOD) provides support for operations concepts development, and for mission, flight crew, and facility operations and training for the Space Station *Freedom* Program and other space flight programs supported by JSC. Support for the Space Shuttle Program and related projects is not included in the OSC.

Major tasks under the OSC are management functions and systems, mission operations, training, ground facility support, Flight Crew Operations Directorate support, and other support to include multiple program operations with responsibility distributed throughout NASA.

Final negotiations on the 10-year cost-plus-award-fee performance contract are pending. The contract includes an eight-year basic period and a two-year option, and is set to begin on or around April 1.

In monetary terms, the OSC contract is second largest. In terms of manpower, it is third largest. The $4.8 billion Space Transportation System Operations Contract (STSOC) is largest, and involves some 4,500 contractor employees, including subcontractors. The Engineering Support contract is second largest in terms of manpower, with 2,100 employees, but only third largest in dollars at $900 million if all options are exercised.

Subcontractors for Rockwell are Barrios Technology Inc., Bendix Field Engineering Corp., Omniplan Corp., Science Applications International Corp., Systems Management American Corp. and UniSys-Air Defense and Space Systems Division.

Other companies and subcontractors submitting proposals were:

- Ford Aerospace Corp. of Houston, with Booz, Allen and Hamilton Inc., GEO Control Systems Inc., GE Government Services, Hernandez Engineering Inc., and TRW Defense Systems Group;
- Lockheed Engineering and Services Corp. of Houston, with Electronic Data Systems Federal Corp; and
- McDonnell Douglas Space Systems Co. of Houston, with Boeing Aerospace Operations Inc., Computer Sciences Corp., International Business Machines Corp. Systems and Integration Division, McDonnell Douglas-Douglas Aircraft Co., and Write Right Technical Publication Inc.

Discovery mating complete; roll out set for next week

By Linda Copley

Preparations for the April 12 launch of the Space Shuttle *Discovery* neared completion Wednesday morning with the hard-mating of the external tank/solid rocket booster stack.

STS-31
Hubble Space Telescope

Mating of the STS-31 stack occurred at 3:30 a.m. Wednesday in Kennedy Space Center's Vehicle Assembly Building (VAB). Umbilical mate preparations were under way Thursday.

Discovery's crew will take the largest telescope ever deployed in space, the Hubble Space Telescope (HST), into orbit on the second day of the five-day mission. The five-member crew, all veterans of previous shuttle missions, includes Commander Loren Shriver, Pilot Charlie Bolden, and Mission Specialists Steve Hawley, Kathy Sullivan and Bruce McCandless.

Mission managers have also targeted an earlier than announced roll-out date. Roll out to Pad 39B is now set to begin two shifts earlier than originally planned, with first motion set for 7 a.m. CST March 15. The date change allows workers a leg-up on hypergolic operations scheduled at the pad. Several days of contingency time remain in the STS-31 processing flow.

A call-to-stations for the shuttle interface test was scheduled for midnight last night. Also, space shuttle main engine nozzle inspections were scheduled to have taken place Wednesday and Thursday.

JSC Photo by Bob Walck

CHILD SAFETY—Tony Palm, a Wormald Fire Systems technician, uses a pipe threader to work on the sprinkler system that is being installed in JSC's new Child Care Center. The center is scheduled to open May 1.

'Space Shuttle' now officially program's title

Space Shuttle Program Director Robert Crippen has announced the change of the title "National Space Transportation System (NSTS)" to "Space Shuttle."

With the advent of the mixed fleet policy, the term "NSTS" is no longer appropriate, according to Crippen, and the name "Space Shuttle" is considered a more familiar term to those outside the agency.

As of now, the terms "NSTS," "STS," and "Space Shuttle" all stand for the same program, although all future documentation should use the term "Space Shuttle" only. Crippen did not suggest updating existing documentation, however, and mission designations of "STS" will not be changed.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.

General Cinema (valid for one year): $3.75 each.

AMC Theater (valid until May 1991): $3.50 each.

Sea World (San Antonio, year long): adults, $17.25; children (3-11) $14.75.

Bluebonnet Trips (March 31, trip to Brenham's Spring Fling; April 7, trip to the Bluebonnet Festival at Chappell Hill, both trips include transportation, visit to Monastery Miniature Horse Ranch, and lunch): $18.

NASA Night at Astroworld (April 6, 6 p.m.-midnight; park is closed to public): the first 5,000 tickets $7.25, after 5,000 tickets are $9.20.

Alaska trip (May 26-June 4, trip to Anchorage includes train ride, river raft trip, oil pipeline tour and more): $1,375 each; $200 deposit needed by March 15.

JSC

Gilruth Center News

Sign up policy—All classes and athletic activities are first come, first served. To enroll, you must sign up in person at the Gilruth Recreation Center. Everyone will be required to show a badge or EAA membership card. Payment must be made in full at the time of registration. Classes tend to fill up four weeks in advance. For more information, call x35789 or x30304.

EAA badges—Dependents and spouses may apply for a photo I.D. 6:30 p.m.-9:30 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m., April 21 and May 19; cost is $15.

Weight Safety—Required course for those wishing to use the Rec Center weight room. The next class will be from 8-9:30, March 22 and April 4.

Low-impact aerobics and exercise—Each eight-week session runs twice a week from 5:15-6:15 p.m. Cost is $24.

Ballroom dance—Classes begin May 3, eight week course; $60 per couple.

SCUBA lessons—Four week course, Monday and Wednesday, beginning March 26. Cost is $45 plus additional fees; free information session, 5-6:30 p.m., March 21, Room 222.

JSC

Dates & Data

Today

Cafeteria menu—Special: barbecue link. Entrees: deviled crabs, broiled codfish, liver and onions. Soup: seafood gumbo. Vegetables: buttered corn, green beans, new potatoes.

Monday

Cafeteria menu—Special: chili and macaroni. Entrees: barbecue sliced beef, parmesan steak, spare rib with kraut. Soup: French onion. Vegetables: ranch beans, English peas, mustard greens.

Tuesday

Cafeteria menu—Special: corned beef hash. Entrees: meatballs and spaghetti, liver and onions, baked ham with sauce. Soup: split pea. Vegetables: buttered cabbage, cream style corn, whipped potatoes.

Wednesday

Threshold forum—The Threshold Forum program will meet with JSC Center Director Aaron Cohen at 7 p.m. on March 14. Attendance at a pre-Forum meeting is mandatory, and space is limited. Contact Stacey Menard, x34507, for information.

Cafeteria menu—Special: barbecue link. Entrees: cheese enchiladas, roast pork and dressing. Soup: seafood gumbo. Vegetables: pinto beans, Spanish rice, turnip greens.

Thursday

Cafeteria menu—Special: chicken fried steak. Entrees: roast beef with dressing, fried perch, chopped sirloin. Soup: beef and barley. Vegetables: whipped potatoes, peas and carrots, buttered squash.

March 16

AIAA Technical Symposium—The Houston section of the American Institute for Aeronautics and Astronautics will conduct its 15th Annual Technical Symposium May 24 at the University of Houston-Clear Lake. Written abstracts are being sought. Abstracts of proposed papers should be submitted along with a completed NASA form FF427 to Michael Laibe, RSOC/R16C, 600 Gemini, Houston, TX, 77058, by March 16. For details, call Laibe at 282-4573.

Artificial intelligence—A call for abstracts has been issued for an Artificial Intelligence and Advanced Automation Techniques for Fault Diagnosis and Recovery Workshop. Deadline for abstracts to be sent to Dennis Lawler, EF5, is March 16. The workshop, sponsored by JSC, the MITRE Corp., and Lockheed Engineering and Sciences Co. will be June 18 at the Gilruth Rec Center. For more information, contact Lawler, x32037, or Christopher Marsh, 333-0984.

Prairie View A&M alumni shopping trip—The JSC Prairie View A&M University Alumni Association will sponsor a Laredo, Texas, shopping trip departing at midnight, March 16 from Gulfgate Mall and returning at midnight March 17. The cost will be $35 for individuals, $65 for couples; contact Cheryl Gobert, x30636, or Tonja Jackson, 282-6794.

Cafeteria menu—Special: corned beef and cabbage with boiled potatoes. Entrees: fried shrimp, baked fish, beef stroganoff. Soup: seafood gumbo. Vegetables: okra and tomatoes, buttered broccoli, carrots in cream sauce.

March 21

Houston Space Business roundtable—The monthly business program will feature JSC Director Aaron Cohen speaking on the Human Exploration Initiative. Registration begins at 11:30 a.m. March 21 at the Nassau Bay Hilton. Tickets are $18 for members, $20 for non-members, and reservations are required. Call 486-5068 for information.

Robotics operations meeting—The South Texas Section of the Aerospace Technical Chapter will hold its monthly dinner meeting beginning at 6 p.m. March 21 at the Ramada Inn, 1303 Nasa Road 1. Graham O'Neil, Lockheed Engineering, will discuss robotic operation challenges for space station. Tickets are $10 if reserved by March 19, $12 after the deadline, and $8 for students; contact Dr. Sam Veerasamy at 333-7409 or 482-1596, or Edward Carter at 333-6791 or 334-2169 for information.

March 27

BAPCO meeting—The Bay Area PC Organization (BAPCO) will meet at 7:30 p.m. March 27 at the League City Bank and Trust. Contact Earl Rubenstein, x34807 or Ron Waldbillig, 337-5074, for information.

March 28

IEEE video conference—"Expert Systems: Integration with Databases and Real-Time Systems" will be discussed from 11 a.m. to 2 p.m. March 28 in the Gilruth Recreation Center. Contact Andy Lindberg, x31474, before March 22 to register.

April 1

UHCL Showcase '90—The University of Houston-Clear Lake (UHCL)'s annual open house, "Showcase '90" will be held from 1-4 p.m., April 1, in Atrium II of the Bayou Bldg. Academic advisers will be available to talk with both graduate and undergraduate students. Contact the admissions office, UHCL, at 488-9240, for more information.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2.

Property

Sale/Lease: 10 acres, 5 mi. W. of Hwy. 146 on FM 517, barn, ponds, util., more. Trey, 280-4381 or 484-7834.

Sale: Kemah lot, 111' x 180', $7,200. 334-1883.

Sale: 60 acres, 3 mi. from Karnes City, TX, on Hwy. 80 w/2-story house on 1.5 lots. 783-9164.

Rent: Lake Livingston, waterfront, 3-2, CA/H, furn., wk or wknd, ex. cond. 482-1582.

Sale: Bay house on Caranchua Bay, 900 sq. ft. on 100' x 125' lot, furn., $40,000. (409) 543-2052.

Sale: Country groc. store on 1 acre, 6 mi. from Crockett, TX. 486-9760.

Rent: Lake travis cabin, accom. 8, wkly/dly, $325/$75. 326-5652.

Sale: Kemah 3-2 on 1.33 acres, $85,000; Kemah lot, 111' x 180', $7,200. 334-1883.

Sale: Meadowgreen, 3-2-2, approx. 2,000 sq. ft., 8.5% assum. FHA loan, $25,000 equity, no app. or closing, $116,000. 480-3909.

Rent: New Orleans condo, April 27-May 4, furn., sleeps 4, $500. 282-6422 or 280-8927.

Rent: Heavenly Valley, Lake Tahoe, 2 BR condo, $350/wk 3/26-4/2. Tom, x38298 or 488-4089.

Lease: El Dorado Way, 1 BR condo, FPL, W/D, ex. cond, $375/mo. w/1 yr. lease, avail. June 1. 282-3391 or 436-1140.

Lease: Piper's Meadow, 3-2-2, FPL, $800/mo. Susan, x37424 or 480-8259.

Lease: Baywind I condo, 3-2, FPL, $525/mo. x34644 or 333-4381.

Trade: Custom 4-3, W. of Austin, prefer 5 yr. old, open plan w/in 20 min. of JSC. 471-8795 or 333-6083.

Sale: SW Houston, 3-2-2, assum. VA, $67,900. 333-7180 or 561-7182.

Sale: 2 lake lots on Toledo Bend Lake, water, elec., septic tank, $10,000. 944-5624.

Sale: 2 lots in La Porte near Hwy. 225, 75' x 220', $5,000/ea. 944-5624.

Sale: CLC, Camino South, 3-2-2, ex. cond., $57,900. 488-2735.

Sale/Lease: Nassau Bay townhouse, 4-2-2, over 2,000 sq. ft., 2-story den, $109,900 or $1,095/mo. Jerry, x38922 or 488-5307.

Sale: Webs./Ellington, 2-1, $450/mo. Dave, x38156 or 486-5181 or Eric, x38420.

Sale: Lg. lots excl. subdiv. near NASA, mid $30's, can fin. Don, x38039 or 333-3313.

Sale: Seabrook, 3-2-2, renov., existing 7% loan plus equity, $275/mo., owner fin., $48,000, no qual., $5,000 down. 474-2857 or 859-4574.

Cars & Trucks

'87 V-8 Firebird, T-Tops, cruise, elec. wndws., AM/FM cass., 34K mi., $7,797.19. Jackie, 483-7426 or 326-5200.

'81 Olds Cutlass Cruiser, ex. cond., new trans., $2,000, OBO. David, 554-5514 or 282-3827.

'69 Mustang GT conv., good cond., needs wk., $3,500. 482-9172.

'80 Olds, Cutlass, V-8, 4-dr., AC, AM/FM/cass., good cond., $900. 486-8551.

'79 280 ZX, auto. console, ex. cond., $2,300 nego. Bobby, 280-8912 or 643-1577.

'74 Fiat 124 TC Spec. station wagon, 1592 c.c., needs wk., $600. Henry, x30022 or 482-5005.

'79 Olds Cutlass, $900, OBO. 534-3240.

'89 Chev. Beretta 2.0-auto., 16K mi., $9,000. 326-2340.

'84 Chev. Cavalier, 2-dr., 60K mi., AC, cass./ster., AM/FM, good mpg, $1,950. Debbie, 282-5281 or 486-1599.

'88 Hyundai Excel SE, 22k mi., clean, 5-spd., $500 down, pick up payments. 488-8198.

'66 Chev. PU, cust. cab, PS, auto., 283 cu. in., 2 barr. Jeff, 497-0740 or 589-1734.

'81 Datsun 280 ZX turbo, T-Tops, auto., AC, AM/FM/cass., ex. cond. $3,200. 283-4171 or 486-8574.

'87 Honda CRX, AC, AM/FM cass., 50K mi., $5,800. Jack, 283-4317.

'82 Porsche 924 turbo, 56K mi., loaded, PW, P/mirr., good cond., $5,900 nego. Randy, 282-6714 or 486-4940.

'85 Toyota MR2, loaded, 5-spd., ex. cond., 54K mi., $6,500, OBO. Cindy, 779-4515 or Darwin, x32142.

'65 Olds Starfire sport coupe, 106K mi., $3,000, OBO. Tom, x38298 or 488-4089.

'88 Dodge Caravan, ex. cond., 2.5L eng., auto., AM/FM cass./ster., $11,100. J. Slight, 799-5434 or 471-0834.

'76 Merc. Mrqs. Brougham, 4-dr. sedan, all pwr., good cond., $1,600. Thom, 474-4663.

'76 Ford Courier, needs body wk., $600. 483-9048 or 554-2504.

'77 Chevy Monte Carlo, good cond., 120K mi., $1,500. Steve, x30719 or 480-6783.

'84 Chev. Cavalier, 60K mi., AC, 2-dr., AM/FM cass./ster., $2,900. Debbie, 282-5281 or 486-1599.

'87 Blazer, V-6, 5-spd., AC, all pwr., $7,900. 333-7180 or 561-7182.

'86 GMC Safari mini van, dual AC, $7,700, OBO. 326-6392.

'80 Pontiac Phoenix liftback, good cond., needs trans wk., auto., AC, $950. 483-0092 or 481-3637.

'84 GMC Sierra Classic, loaded, 68K, $4,850; classic '79 Seville, 51K, $3,500. Don, x38039 or 333-3313.

'Porsche 911S, 5-spd., AC, cust. int. 445-4037.

'79 Cutlass Supreme Brougham, V-8, 2-dr., AC, PS, auto., ex. cond., $1,895, OBO. 280-8796.

'79 Pontiac Phoenix, 62K mi., $400. Wally, 280-1118 or 532-1953.

'84 Corvette coupe, auto., 62K mi., $10,350. Wally, 280-1118 or 532-1953.

'84 Nissan Sentra, 5-spd., 2-dr., AC, good cond., $2,300, BO. 333-7206.

Cycles

'83 Suzuki GN125cc, low mi. 474-7006.

'78 Kawasaki KZ650, less than 7K mi., w/helmet. Steve, x35806 or 333-4222.

'81 Suzuki 850cc, Vetter fairing/windscreen, low mi., ex. cond., $1,400. Patrick, x32635 or 488-1079.

Boats & Planes

15' Tidecraft boat w/trlr., 50hp Merc., $1,200, OBO. 488-4453.

'83 25' Catalina, 7.5hp Johnson, 6 sails, sleeps 6, EZ loader trlr., $13,500. 474-5414; EZ loader trlr., accomm. up to 25" boat, was $3,000, now $1,500. 474-5414.

Sensenich propeller, Model M74DM-0-58, used on some beech, PA-20 and PA-28 series aircraft. 538-2299.

Sailboard, Bic 250, $175. 280-9870.

'84 Kawasaki 440 Jetski, $2,000; '83 Kawasaki 550 Jetski, $2,000. Andy, 333-6671 or 332-9105.

Audiovisual & Computers

Intel 380 computer sys., 8086/87 w/896K mem., 35m hard drive and 5 serial ports, RMX-86 real time oper. sys., software for mult. lang.. 488-4453.

Commodore 64K, 1541 disk drive, Star printer and modem, $350. 554-2470.

Bearcat/Uniden scanner, 10 chan. prog. base unit, Fire/Med./Police/etc., ex. cond., $100. 474-7006.

Star NX1000 multi-font NLQ printer, IBM compat., $250, OBO. Lonnie, 282-2731 or 482-0547.

TI-994A computer w/expan. box, ext. mem., floppy disk, disk manager, ext. basic, TI writer, BO. Mark, x31997 or 334-1474.

(2) Motorola Mocom 70s, FM 2-way radios, $400, OBO. 482-3985 or 282-3841.

IBM XT computer, 10 meg hard disk, IBM monitor, $950, or w/Intel 386 inboard (1 meg) comp. installed, $1,450. 483-0092 or 481-3637.

Household

Dinette set, smoked glass round top, 4 chairs, $200. Jackie, 483-7426 or 326-5200.

19" Zenith color console TV, $150. Laura, 333-9733.

Contemp. solid oak kingsz. waterbed w/6 drwrs. under, mirr. hdbd. w/match. highboy dresser, nightstand, ex. cond., $850; Scan. style enter. cent., $250; rust colored La-Z-Boy recl., $150. 488-0151.

Kingsz. semi-motionless wtbd., mirr. hdbd. w/shelves, $200. Mike, 282-4696 or 554-7614.

Whirlpool elec. dryer, works fine, $100, OBO. x38520 or 332-1614.

Waterbed, 8' round, mirr. hdbd., htr., fitted sheet, $100, OBO. Lee, x34820.

Musical Instruments

Fender concert amp, tube type, ex. cond., $295; Gibson-Epiphone Emp. jazz guitar, ex. cond., $795. Ed, 326-1179.

Ovation acoustic guitar, Legend model, $400. 482-9172.

Pets & Livestock

Baby hand-fed cockatiels, 3 wks. old. Linda, 484-7834.

AKC min. Schnauzers, S/P, 4 fem., shots, wormed, dew claws rem., born 11-30-89, $250. 487-9243.

10 mo. Yorkie male, AKC reg., $350. 488-8198.

Albino ferret, 4 mos. old, shots, neutered, descentized, $150. 483-0424 or 484-7659.

Personal

Armand Bayou Nature Center is now recycling all types of items, center is open 1-4 p.m. on 1st Sun. of every month. 474-2551.

Wanted

Want condensing unit, 3-ton. 944-9152.

Want Grace Livingston Hill books. 282-6606.

Want any conval. care equip. Garland Hector, 488-0217.

5-string banjo player wishes to meet bluegrass guitar, bass, fiddle players. Tom, 480-9668.

Want riders to carpool from the I-10/Hwy. 6 Park and Ride to JSC/CL, 7:30 a.m.-4 p.m. x31810.

Want SLR cam. lenses w/Praktica (screw-mount). Chris, 538-1253.

Want Starwars spaceships, toys, fig., books. Ron, 482-1385.

Want cheap work car or truck. 482-4156.

Want W/D, dryers, stoves, refrig., freezers, etc. 333-6558.

Want Volvo 15" turbo wheel, 5 sprokes, in good cond. Vincent, x30874 or 333-1316.

Miscellaneous

Tour Model III irons, 1-9, PW&SW, $18.20/iron, metal woods, $30/wood. David, 554-5514.

Garden tiller, 5hp Wards, good cond., $300. 334-1883.

Bag boy golf cart, $25; 26" bike, $45. 944-9152.

White lace/silv. lame tea lgth. formal, sz. 1, $35; child's beginner set golf clubs, 3 irons, 1 wood, putter, bag, $25. 944-8312.

Bang and Olufsen beagram RX turntable, ex. cond., incl. new B&O MMC5 stylus, $200. x34391 or 482-7473.

Sofa, chair, $300; coffee, end, drum table, $100/ea.; micro., $100; stereo radio con., $75; ladies mink/leather trim stroller, sz. L, $900. 488-3588.

Sears calorie monitor exer. bike, $120. 280-0345.

Mod. airplane mag., air trails, mod. airplane news, flying models, mod. builder at cost. 534-3021.

Plas. model airplane kits, 1/12" scale, WWI, betw. wars, WWII, at cost. 534-3021.

Winchester gun case, padded and felt-lined int., also fits Browning, etc. in S/S or O/U, 26" barrels or shorter, $65. x34614 or 334-2278.

46-pc. Franciscan Hacienda green earthenware, $200; 24-pc. matching glassware/dessert set, $50. 474-3517.

Atari w/30 games and SEGA w/6 games. Joseph, 326-2187.

Trad./Span. oak wood/veneer tables, rect. coffee table w/matching end tables, $100. 481-5913.

Walnut coffee table w/glass top, $50; Oak bookcase, 6'x3', $60; Persian rug, pastel colors, 5'x3', $60. Carri, x31985.

Books on Cass., Day of the Cheetah, The First Deadly Sin, Tracks, $7/ea. Ronnie, x32539.

RCBS Rockchucker II primer catcher, priming arm, $50. 335-3408 or 486-4369.

Dilly galv. trlr., $425; 2 swiv. boat seats, $40/both; S.S. 23 gal. gas tank, 14"x8"x48", $35; glove box, $10; S.S. Johnson prop., $100; OMC 6 gal. gas tank, $20. Andy, 333-6671 or 332-9105.

2 boys 16" bicycles, $15/ea.; 1 mini scooter w/9" wheels, $10. 538-1849.

Lady Remington shaver, $5; household water filter sys., 5,000 gal., $99. Kathleen, 333-7075 or 480-1024.

Ski trip (spring break wk.) to Powderhorn, CO, roundtrip tickets, 4 days/nights, $295/ea., all four, $1,100. 554-2824.

For 280Z, '79-'83, T-top bags, $20; T-top sun shades, $15; bra, $35. 554-2824.

Graco high chair, $30; Cosco walker, $25. Youm Nguyen, 483-2142.

AC compressor, 3.5 ton, carrier, $100, OBO. x34557 or 485-1541.

Man's 3-pc. suit, hand-tailored wool, dk. blue pin stripe, sz. 42-44 tall, was $300, now $65. x34557 or 485-1541.

Brother sewing mach., $200; childs desk, $25; childs stereo, $25; NSA clean water filter appli., $110. 482-4156.

PSE Pulsar adj. wgt. draw, compound bow w/extras, $100. 944-5624.

3,000 lb. press. unit w//heater, soap inj., access. mounted in '84 3/4 ton Ford PU w/5'x8' trlr., 400 gal. lined water tank, $12,500. John, 324-3884.

Eng. ring, 18 karat yellow gold, round diamond solitaire, .68 carats w/6 round diamonds, .18 carats, was $1,500, now $1,300, OBO. x30874 or 333-1316.

Canon 35mm cam. w/AEC, $75; Sears elec. correc. typewriter, $50. x38520 or 332-1614.

Solid mahog. desk, good cond., $150; indus. qual. util. table, $50. 474-7312 or 333-6883.

Leer truck camper for short bed PU, $300. Steve, 471-6160.

Computer desk w/chair, ex. cond., one bedframe, adj. w/wide caster. 488-2822.

Ricoh Rapidcom 120 fax, sell or trade. 485-9643.

Lg. Seacoast oil painting, oriental, 5'x7', $400. 326-2795.

Quasar 19" TV, $50; dishwasher, port., $65; 4-pc. BR set, queen or full, $400; platform rocker, cloth uphol., $50; twin bed matt./box springs, $90; sm. desk, $75; fert. spreader, $10; 2/ea. 15" wheels w/tires GM fit, $40; 326-2795.

Mike Myers 5'8" twinfin surfboard, ex. cond., $150; DP sta. bike, $25. Richard, 483-0415 or 480-0524.

Antiques, wheelchair, quilts, rec. player, iron bed, sewing mach., walking plow, 1847 Wm. Rogers Silverplate, 56-pc. plus 7 ex. pcs. 783-9164.

SPACE STATION TRACK TEAM

First space walk in years has come long way in short time, now planned for November

By James Hartsfield

In November, astronauts will step out of the door 243 nautical miles above Earth for the first NASA space walk in five years, or as it might be better described, a space ride.

STS-37 shuttle crew members Jerry Ross and Jay Apt will conduct the Crew and Equipment Translation Aid (CETA) flight experiment in the payload bay of *Atlantis*. Ross and Apt will try three different methods of propelling a small cart along rails in the bay in an effort to identify the best way to move around on the exterior of Space Station *Freedom*. Necessity, good timing and enthusiasm have pushed CETA a long way in a short time.

"EVA's are something it's easy to get people excited about," said Ed Whitsett, CETA project manager. "People have been willing to make a lot of sacrifices to pull this all together."

CETA didn't exist until June 1989, after the final payload review for STS-37 had already taken place, Whitsett said. But the experiment, through long hours put in by those supporting it, came together and was ready for the previously scheduled launch of STS-37 this June. The flight crew played a large part in getting the experiment on track for the prospective launch date.

Although mechanical tests and procedural checks of CETA are the primary reason behind the space walk, an important contributing factor is the simple need for NASA to take a walk on the high side again.

"We're excited about it," explained Ross, who will make his third space walk. "We're anxious to build up the EVA team again, to build up the experience base. We see a quantum jump ahead in the amount of time spent EVA as space station gets closer."

The five-year lapse has taken a toll on experienced EVA personnel available among astronauts, flight controllers, engineers and other team members.

"The crew needs to get operational experience for EVAs and we need to get EVA inputs for space station design—it's a perfect match," Whitsett said.

By coincidence, Ross was the last American to shut the door on space, after conducting two space walks on STS-61B in late November 1985.

"When I got back inside after my second EVA on 61B, I thought that was the finale... I'd never have that opportunity again," Ross said. "But through a strange twist, I'm going to do this one. You know, I smile a lot thinking about it. It is really a fantastic experience you just can never fully explain to anyone."

A method for crew members to move up and down the 400-foot long space station truss structure has always been planned, but the original concept was akin to a large space golf cart.

"We thought it was overkill," Whitsett said. "It was like taking a bus when all you need to do is go out to the back field on your motorcycle."

Although the simplest method of movement would be a hand-over-hand pull down the truss, with no special equipment except a tether, such a method could cause excessive wear and tear on the truss and suit. Also, it would be difficult to carry cargo.

CETA may be the answer. It is a small cart that runs along a track that can be built into the Space Station *Freedom* truss. Astronauts would ride prone on CETA, and could pull equipment along behind them. But how to propel the cart, how much stress the various methods of movement would put on the truss and the astronaut, and how fast it can be comfortably and safely moved are questions to be studied on STS-37.

The cart will be mounted on a track in the payload bay, skirted by two handrails for half of the bay and by one rail, to be extended following deployment of the Gamma Ray Observatory (GRO), for the entire distance of 46 feet. Apt and Ross will move the cart in three different fashions. In one, one crewman will lie prone and pull himself along the track hand over hand. In another, the astronaut will be angled upward slightly and a lever will be installed on the cart. The crewman will pump the lever—much like an old railroad handcar—to move it up and down the track. In the third method, the angled crewman will turn hand-pushed pedals similar to bicycle pedals that generate electricity to drive the cart.

The first two versions of CETA are called the manual and mechanical cart designs. The third is the electrical design. All of the versions include brakes and provisions for moving in reverse, which, for the electrical version consists of turning the pedals backward, creating a reverse current that in turn drives the electric motor backward.

Ross and Apt will evaluate the amount of energy required to move each version; comfort; how secure they feel moving in them; control; and visibility. Sensors on the track and cart will provide information on the amount of stress each version places on the track and handrails. Although CETA is a one-person cart, Ross and Apt also will propel themselves "piggyback" on each version to test the cart's cargo-carrying ability.

The astronauts also will test a one-person "tether shuttle," a very simple, small cart designed to attach a tether to so it can slide along as an astronaut pulls hand-over-hand along the railway. The "tether shuttle" is intended as a way for one crew member, carrying no extra cargo, to move around if the main cart were unavailable.

CETA will take up most of the single, six-hour space walk planned, but Apt and Ross will do some additional tasks. Using the shuttle's robot arm, they will evaluate how much flexibility can be allowed in the Astronaut Positioning System (APS) and how quickly an astronaut can be moved comfortably at the end of an arm. The APS is a manipulator arm planned for use when astronauts begin assembling the truss structure for Space Station *Freedom*. It will move an astronaut, standing in foot restraints at its end, from place to place to assemble the various joints.

Using the Crew Loads Instrumented Pallet (CLIP), an EVA workstation mounted on the side of the shuttle's bay, the astronauts will gather more information on stresses imparted to structures during space work. The pallet part of CLIP has flown twice aboard the shuttle.

The results of CETA and the other EVA experiments scheduled on STS-37 could make some designs for Space Station *Freedom* space walk aids less complex, Whitsett said. Making CETA a reality has been the result of contributions from literally hundreds of people, he added.

'EVA's are something it's easy to get people excited about'

—Ed Whitsett, CETA project manager

The track and rolling base plate were designed and built by a team from Langley Research Center. The equipment needed to record experiment results was designed and built by JSC's Avionics Systems Division; JSC's Structures and Mechanics Division performed structural certification and assisted with instrumenting the rails, cart and track to measure stress; and JSC's Technical Services Division has built much of the equipment that will fly. Prime space station contractor McDonnell Douglas designed and built the manual cart and tether shuttle and provided technical and integration support as well.

The efforts to make CETA a reality have been led by the Crew and Thermal Systems Division with Whitsett, who has served as project manager; Steve Poulos, who has coordinated matching CETA with the shuttle's needs; and Jim O'Kane, who has overseen many of the development efforts. John Gustafson was detailed to JSC from Langley to lead that center's work.

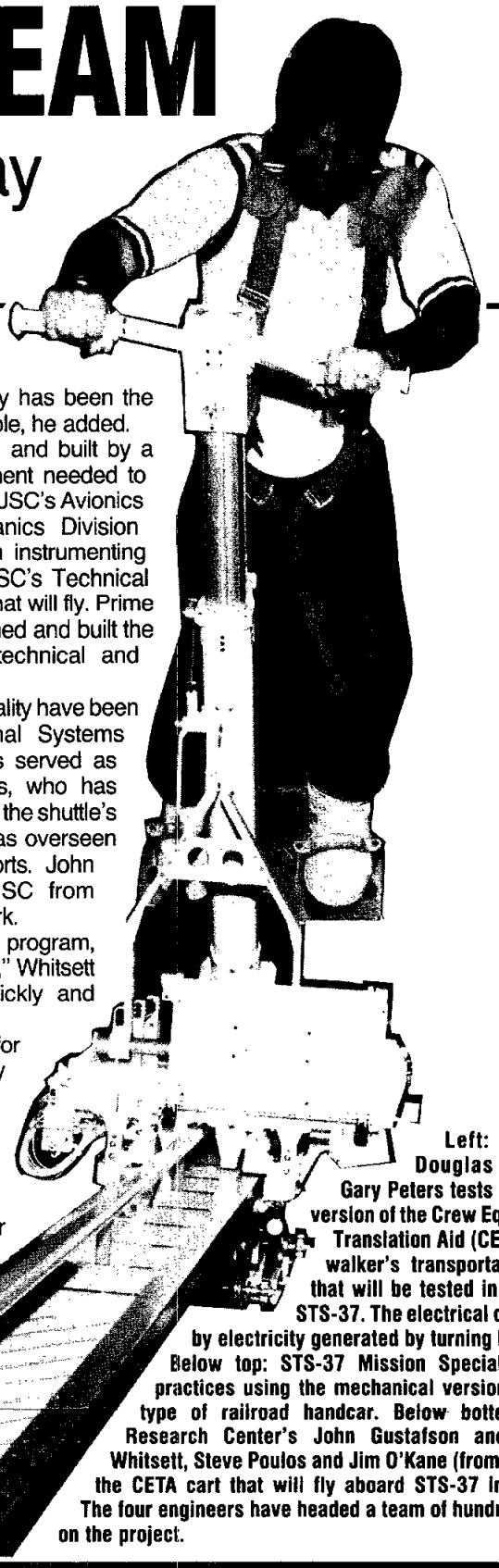
"It has been kind of a crash program, but there's been a real fine team," Whitsett said. "It's fallen into place quickly and smoothly."

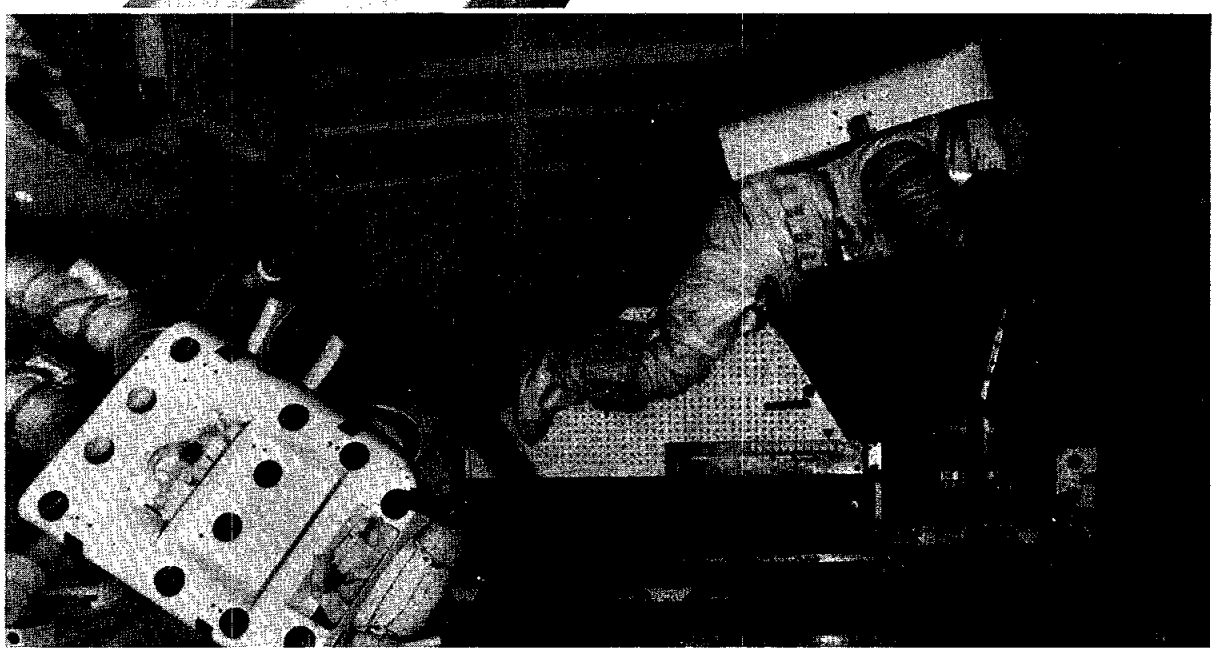
The launch of STS-37 originally was scheduled for June, but it has been reset for November. The delay is disappointing for those who've worked on CETA, but the extra time won't be wasted.

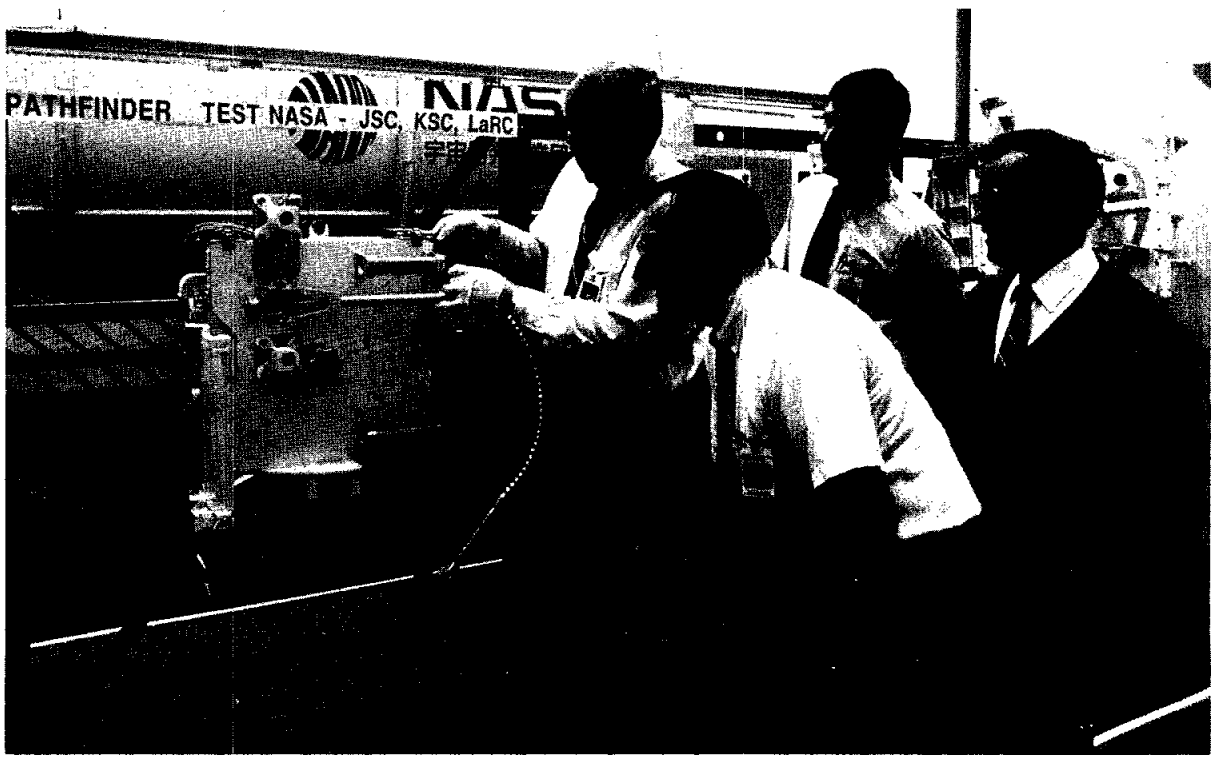
"The time will allow for some things we were a little pressed on to be double-checked," Whitsett said.

As the first scheduled space walk, preparing for CETA has taken added care over past EVAs, he added.

"We're kind of an icebreaker — people want to be very certain of everything. We'll be going through the EVA operation with as much caution as was done for the return-to-flight. But it's time for another space walk," Whitsett said.







Left: McDonnell Douglas engineer Gary Peters tests an electrical version of the Crew Equipment and Translation Aid (CETA), a space walker's transportation system that will be tested in orbit during STS-37. The electrical cart is moved by electricity generated by turning hand pedals. Below top: STS-37 Mission Specialist Jay Apt practices using the mechanical version of CETA, a type of railroad handcar. Below bottom: Langley Research Center's John Gustafson and JSC's Ed Whitsett, Steve Poulos and Jim O'Kane (from left) inspect the CETA cart that will fly aboard STS-37 in November. The four engineers have headed a team of hundreds working on the project. NASA Photos

Sterling new Tech Services deputy

Boyce E. Sterling has been appointed deputy chief of the Technical Services Division in JSC's Center Operations Directorate.

He will assist in the planning, coordinating, managing, directing and supervising of personnel engaged in providing technical services support for the center.

Sterling came to JSC in 1966, and most recently was chief of the Tech Services Machine Branch.

Pair earns problem correction award

Emmett Dickinson and Cheryl Kokosz have received the Problem Tracking and Corrective Action (PRACA) Awards for the STS-34 mission.

JSC
People

The award, presented by Safety, Reliability and Quality Assurance Director Charles Harlan, recognizes outstanding efforts in the timely and accurate resolution of orbiter problems by a subsystem manager and reliablity/quality engineer. Dickinson is subsystem manager and Kokosz reliability engineer for the orbiter displays and controls subsystem.

JSC's Mendell technical adviser for TV pilot

JSC planetary scientist Wendell Mendell recently returned from a trip to Culver City, Calif., where he witnessed shooting for "Plymouth," an upcoming television series pilot about the first town on the Moon.

Sterling Dickinson Kokosz Mendell

Mendell, who has been the project's technical adviser for the past year and a half, said he was particularly impressed with the sets for the TV movie, which filled three sound stages.

One of the main characters, Wendell MacKenzies, was named after Mendell.

The movie, co-produced by Walt Disney Television, RAI-Uno Radiotelevision and Lee David Zlotoff, revolves around a small logging town that moves to the Moon after being rendered uninhabitable by a toxic accident.

Project IQ accepting applications

The JSC Project Increased Qualifications (IQ) Program is now accepting applications from JSC employees. Project IQ is designed to provide undergraduate college study opportunities during duty hours to those selected for the program.

The program will assist participants in improving their skills and qualifications in order to be more productive in their current jobs and to become better qualified for potential promotions.

Participants in the two-year program may attend one to three college courses each semester during duty hours. Actual time away from work may not exceed eight hours a week.

JSC will pay training costs, including tuition, required fees, and textbooks. Mileage and other costs associated with travel to the training site are the responsibility of the participant.

To qualify, applicants must be a permanent JSC employee with at least one year of continuous civil service; occupy a non-professional position in grades GS-1 through GS-11; and have successfully completed a minimum of six semester hours of college-level work, preferably within the past two years. Employees who already possess a bachelor's degree are ineligible.

To be considered for selection, applicants must provide a written recommendation from their immediate supervisor, a brief statement of academic purpose and grades from their previous coursework. The level of activity in the employee's office and the applicant's own workload will also be considered.

Applications are available in the Human Resources Development Branch, Bldg. 45, room 146. Contact Debbie Hagen, x33078, for more information, or call Laura Bright, x33067, to have an application mailed to you.

NASA Photo

BIG ENDEAVOUR—Endeavour's distinguishing marks were added to the starboard wing recently at Rockwell International's Palmdale, Calif., final assembly facility. The painters are, from left, Andy Andres, Tom O'Brien and Sammy Gonzales. Bob Brown, JSC's contracting officer for OV-105, says construction of the orbiter is about 70 percent complete.

NASA gets loan of 3 supersonic Blackbird jets

Three of the supersonic SR-71 "Blackbird" aircraft that are being retired from the U.S. Air Force have been loaned to NASA's Ames-Dryden Flight Research Facility at Edwards, Calif.

The last Air Force flight of a Blackbird made history Tuesday, traveling from coast to coast in 68 minutes, 17 seconds and arriving at Dulles International Airport in Washington, D.C., to the cheers of hundreds of onlookers. The old record was 3 hours, 38 minutes, set in 1963 by a Boeing 707.

The Blackbird took a running start, refueling over the Pacific Ocean at 60,000 feet before crossing the California coast, and reached the finish line near Salisbury, Md. The Blackbird then refueled before flying back to Dulles.

The first Blackbird loaned to NASA arrived Feb. 15, and the second arrived Feb. 20.

The aircraft will be in flyable storage at Ames-Dryden until the Air Force determines it no longer has a need to preserve them. NASA would like to use the aircraft to fly scientific experiments requiring high-speed research testbeds.

The Dryden facility operated YF-12s, similar to SR-71s, from 1969 to 1979, gaining much useful research data on structures and stability and control at high speeds and altitudes. Air-breathing propulsion information highlighted the program.

The SR-71s are capable of flying at greater than three times the speed of sound. The approximately 101-foot long titanium structure is powered by two J58 engines. The airplanes are coated with a special black paint that helps dissipate heat caused by high speeds. The manufacturer is Lockheed Corp.

JSC establishes Frequent Flyer Program, rules

An official Frequent Flyer Program (FFP) will be initiated at JSC on March 12, and participating employees now must account for, and relinquish, any benefit received as a result of official government travel.

Once the JSC FFP is established, employee positions identified as frequent flyers by the JSC Transportation Officer must enroll in the JSC FFP. Employees participating will be required to sign an awareness certificate periodically.

The JSC Transportation Officer will assign government frequent flyer account numbers. These numbers will be entered with travel reservations each time an employee goes on tour of duty.

Employees are advised to establish personal accounts and a personal mailing address to ensure personal mileage credits are not combined with official credits.

Employees may keep promotional items worth less than $10, and they may participate in promotional programs that will accrue personal benefits such as free seat upgrades.

Travel bonuses carrying expiration dates and nontransferable travel coupons must be turned in, even though they cannot be used by the government. Promotional items resulting from mixed government and personal travel are government property.

An employee may keep any payments for voluntarily giving up a seat on an overbooked flight, but any additional travel expenses incurred are the employee's responsibility. If an employee is compensated for involuntarily denied boarding, however, the payment must be relinquished to the government.

Questions regarding air travel regulations should be referred to June Trim, x35805, or Norma Wells, x30331.

National Aerospace Forum opens at JSC

The JSC Black Employee Advisory Committee and the National Technical Association have initiated an Aerospace Forum at JSC.

The Aerospace Forum is a national project of the National Aerospace Forum (NAF), and is sponsored at other NASA centers.

The forum will serve as a resource to all JSC employees, and will be used as an information resource by aspiring aerospace students of local universities, such as Prairie View A&M, Texas Southern University, and the University of Houston.

"We expect to have the first meeting of the forum within the next few months," said Elizabeth Smith, a technical manager in the Space Station Projects Office and an Aerospace Forum advisory committee member.

JSC civil servant and contractor employees are encouraged to learn more about the forum by contacting Carrington Stewart, x31404; Robert Ligons, x31308; or Smith at x30427.

Atlantis crew gets warm welcome at Ellington

(Continued from Page 1)

Shortly after the de-orbit burn was completed, an unusual decrease in the hydraulic reservoir quantity indicated a possible leak. As a precaution, APU-1 was switched to low-pressure until *Atlantis* reached about Mach 2.5 during descent. It was then returned to normal for landing, and performed normally. APU-1 was shut down immediately after landing, again as a precaution.

Engineers inspecting *Atlantis* at Edwards reported finding a thin coating of hydraulic fluid throughout the aft compartment as a result of a ruptured high pressure outlet hose for APU-1.

Thanks to a strong tailwind, the crew arrived back at Ellington about 25 minutes early.

"Sometimes it requires patience in order to do the job correctly," said JSC Director Aaron Cohen as he welcomed them, referring to several false starts on the STS-36 launch. "We did the job correctly. The ground team, the flight crew and the shuttle performed in an outstanding manner."

Creighton, whose cold caused the first postponement, gave special thanks to Flight Surgeons Bradley Beck and Philip Stepaniak.

"Since I had probably the world's most famous cold, I would like to give special thanks to two doctors that helped us out," he said. "Without their help, we'd probably still be in Florida."

Pilot John Casper said he felt a tremendous sense of pride at being part of the NASA team. "It's an amazing thing we do, to put this vehicle up into space again and again. It's through the efforts of all of you people out there either working directly or indirectly in support of NASA. I'm proud to be part of that team, and you should be proud, too."

Mission Specialist Dave Hilmers said perseverance was the watchword of the mission, and remembered the many people who came out in the middle of the night to help with between-launch-attempt simulations at JSC. "With that kind of perseverance, NASA is going to continue to fly successfully," he said.

"There is no finer organization in the world," added Mission Specialist Mike Mullane, who announced his impending retirement before the flight. "Not in government, not in universities, not in industry."

Mission Specialist Pierre Thuot likened the welcome home ceremonies to the academy awards, and shared his with the entire supporting cast. "The STS-36 crew just got an academy award for best flight," he said.

Lunar conference begins

(Continued from Page 1)

meteorites; Triton and Phobos; and planetary geological processes.

At 8:30 a.m. Wednesday, a technical session will feature discussions on interplanetary dust and LDEF findings. The STS-32 shuttle crew retrieved LDEF, a bus-sized satellite stranded in space for nearly six years, from space Jan. 12.

This year's activities also will feature a chili cook off for conference participants only and an evening session sponsored by the Planetary Society that will be open to the public.

The cook off will begin at 6 p.m. Tuesday and will be held on the grounds of the Lunar and Planetary Institute. For cook-off information, call 486-2166.

Space News Roundup

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Editor . . . . . Kelly Humphries
Associate Editor . . . . . Linda Copley

Scholarship entries still being accepted

Applications for the NASA College Scholarship Fund will be accepted until March 16. Three $6,000 scholarships are available this year to dependents of NASA civil servants and military detailees.

Forms are available in Bldg. 12, Rm. 840. For more information, call Mary O'Connell at x39168.