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

STS-52, eh?

Get a preview of photos from the *Columbia* crew's post-flight employee presentation. Photos on Page 3.

Full house

JSC's Technical Services Division had a full house for last week's open house for JSC employees. Photo on Page 4.

Space News Roundup

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Task groups report on tether trouble, satellite rescues

Board says late hardware change snarled tether

NASA's Tethered Satellite System Investigative Board says a protruding bolt prevented full deployment of the satellite during STS-46, and that the late hardware change should have been caught in the systems engineering review.

The 47-page report, released last Friday, examined five problems that occurred during the deployment effort and identified causes for four of them. It made recommendations for actions to be taken to prevent similar occurrences in the future.

The board said the two snags during deployment and retrieval—when first releasing the satellite from the deployer and when the satellite was at 735 feet—were due to slack which developed in the tether at a point where it moves between one pulley and another—somewhat similar to movie film misfeeding in a projector.

"The crew found a way to procedurally get around this slack problem," said Board Chairman Darrell Branscome. "In both cases the jamming was overcome. By itself, this problem would not have prevented us from fully

Please see **NASA**, Page 4

Benefits must outweigh rescue mission risks

A task group looking into issues concerning future satellite rescue and repair says NASA should continue to perform such missions, but only when the benefits outweigh the risks.

"The unique ability to accomplish satellite rescue and repair should not be forfeited," said task force Chairman Dr. Eugene E. Covert. "But these missions pose inherent risks to the shuttle and should be undertaken only when the benefits outweigh the risks." Covert added the authority to employ this capability should rest solely with the NASA administrator.

The NASA Advisory Council Group Task Force was established at the direction of NASA Administrator Daniel Goldin. Chairman Covert is a professor of Aeronautics and Astronautics at Massachusetts Institute Of Technology. Vice Chairman was former astronaut Lt. Gen. Thomas Stafford.

While pointing out that opportunities for performing unanticipated satellite rescue or repair missions in the future are likely to be rare, the report says the unique ability to accomplish such missions should not be forfeited.

Please see **PANEL**, Page 4

Metric apples more exact than English oranges

[Editor's note: This is the third installment in a series of articles intended to explain the importance and relevance of JSC's move to the metric system.]

Sir Isaac, of JSC's Engineering Directorate recently was overheard talking to Clear Creek High School co-op student Penny Pound about a just completed tour of a JSC laboratory.

Penny: Would you explain to me again why I don't weigh 130 pounds?

Sir Isaac: It's because "weight" is a confusing term. In everyday terminology you do "weigh" 130 pounds.

Think JSC I Metric

Penny: Well, a pound is a pound is a pound. I should know—I diet every ounce off to keep my weight down.

Sir Isaac: The point is, Penny, that a pound is *not* always just a pound. On the Moon, for example our astronauts are essentially the same size or "mass," yet they "weigh" only one-sixth as much as when they were on the Earth waiting for lift-off.

Penny: Do you mean there's a difference between how big I am and how much I weigh?

Sir Isaac: Essentially, yes. You are using "big" to mean how much mass your body contains and "weight" to mean how your mass is affected by gravity. Even here at NASA there is sometimes confusion between laboratory scientists and customers if both do not carefully denote "pound" and "weight."

Penny: I don't understand.

Sir Isaac: Through long years of

Please see **PENNY**, Page 4

JSC Photo by Bob Walck

Russian cosmonauts Sergei Krikalev, left, and Vladimir Titov, right, share a team handshake with STS-60 Pilot Ken Reightler. The cosmonauts met the American press Tuesday in Bldg. 9.

Cosmonauts begin training at JSC

By Kelly Humphries

Russian cosmonauts Sergei Krikalev and Vladimir Titov began training this week at JSC for their upcoming shuttle mission.

"Hopefully the experience of cooperation we gain here will lay the foundation for the future work between our cosmonauts and scientists and will be followed by other endeavors," said Vladimir Titov, one of the two Russians who will be mission specialists on STS-60, speaking through an interpreter.

"We have already started the training and learning the materials necessary for the accomplishment of the mission," added Sergei Krikalev. "It is still early to say anything definite about our future life and training in the United States, but we can already say that there is something different and a lot in common."

In introducing his crew mates, STS-60 Pilot Ken Reightler said the cooperative mission is "a real gem to be assigned to." The six-person crew led by Commander Charlie Bolden will fly on *Discovery* for eight days, testing a wake shield facility expected to create an ultravacuum for materials processing, using the Spacehab middeck extension module and conducting joint U.S.-Russian experiments.

"We have already met our counterparts, the crew members of the STS-60 mission, and similar to the treatment in Moscow we give the newcomers, we can feel here—warmth and great care," Krikalev said.

The cosmonauts said their families will arrive Nov. 21, and that while they expect their wives and children will have some difficulty adjusting to new roads, new stores and new schools, they hope the adjustment will be quick.

"We're certainly thrilled to participate in this mission, since this is quite a new direction for us," Titov added. "We're very happy that the first contact during the first contact during the Soyuz-Apollo mission was followed by our cooperative work now."

Discovery rehearsal ends today

The STS-53 crew — Commander Dave Walker, Pilot Bob Cabana and Mission Specialists Guy Bluford, Jim Voss and Rich Clifford — will complete a dress rehearsal countdown at Kennedy Space Center today as preparations of *Discovery* continue toward an early December launch.

The terminal countdown demonstration test for the upcoming launch is set to culminate with a simulated T-minus-0 at 10 a.m. today.

Managers are scheduled to meet Thursday for final review of the mission preparations, after which an official launch date, perhaps as early as Dec. 2, will be announced.

STS-53 WALKER CABANA BLUFORD CLIFFORD VOSS DISCOVERY

Discovery was moved to Launch Pad 39A Sunday morning, and technicians are scheduled to complete checks of the solid rockets today and do a final leak check of the main engines this week.

Meanwhile, the crew of STS-54—Commander John Casper, Pilot Don MacMonagle and Mission Specialists Greg Harbaugh, Susan Helms and Mario Runco, Jr.—scheduled for an early January 1993 launch will perform a final pre-flight inspection of *Endeavour*'s cargo bay Saturday at KSC. *Endeavour*, in the Bay 1 processing hangar, will be moved to the Vehicle Assembly Bldg. to be linked to the solid rockets and fuel tank on Friday.

This week, the cargo for STS-54—a NASA Tracking and Data Relay communications satellite and the Inertial Upper Stage solid rocket that will propel it to a 22,500-mile orbit—was loaded into a protective canister and taken to Launch Pad 39B to await *Endeavour*.

Elsewhere, *Columbia* is undergoing post-flight inspections and beginning preparations in the Bay 2 hangar for a late February 1993 launch on STS-55. This week, the windows, engines and star trackers were inspected; residual fuels were drained; the United States Microgravity Payload-1 was removed from the cargo bay; and the wheels and tires were removed.

Atlantis remains in Palmdale, Calif., at Rockwell's shuttle factory for a year of upgrades, inspections and modifications to be completed in late August 1993.

Advanced concepts office to push creativity

NASA Administrator Daniel Goldin said Tuesday that the newly created Office of Advanced Concepts and Technology will pursue innovative ideas and high leverage technology.

The new office will not be a "stapling together" of previous commercial program and space technology activities, but an "entirely new breed—a highly flexible, customer-driven organization," Goldin said.

The new office will have four primary functions that will fulfill NASA's needs and create commercial possibilities.

First is a systems engineering team capable of judging the feasibility and cost of innovative ideas.

"Currently, there is no place in NASA where someone with an advanced concept can go to get an idea properly considered and evaluated. Furthermore, in the rush to bend metal, there usually is little consideration of operations or life cycle costs," Goldin said.

Such an advanced systems engineering function will help bridge the gap between technology development and commercial applications "so we avoid ending up with 'hobby shops' that aren't aligned with customers' needs, while commercial opportunities fall by the wayside."

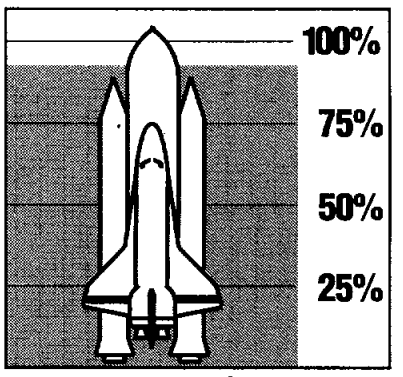
Second, the office will be the agency's "front door" for businesses that seek NASA expertise in developing new ideas and technologies. This "one-stop shopping" center also will serve universities and even NASA program offices, Goldin said. Now, people with new ideas often are shuffled from office to office.

The third major function will be to transfer technology into the commercial sector at a faster pace. The office will welcome ideas from any source.

"We want to abolish the 'not invented here' syndrome which breeds insularity and fails to seize the good ideas within and outside of NASA," he said.

The fourth function will be to stimulate true commercial space activity in which space-related products and processes are developed by industry and sold in commercial markets.

"For everyone who's worried about the American economy being stuck in a rut, it's vital that we remember the tremendous power of technology to produce growth."



1992 GOAL: $440,000

CFC

Shuttle integrator wins second pair of airline tickets

The winner of the second pair of Combined Federal Campaign airline tickets to anywhere in the continental U.S. went to Anita Jenkerson of the Space Shuttle Program's Management Integration Office.

One more name will be drawn from a hopper containing the names of employees who have decided to contribute 1-hour's pay or more a month to the CFC. The tickets are provided at no cost to JSC by Continental Airlines.

So far, JSC employees have contributed more than $400,000. This year's CFC officially concluded Tuesday, but pledges will continue to be accepted.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays. For more information, call x35350 or x30990.

Pecan harvest (9 a.m. Nov. 14, pecan grove): free tickets first-come, first-served, one per badged employee.

Dickens on the Strand (Dec. 5-6, Galveston); adult, $6; children under 12, free.

Space Center Houston — Discount tickets available: adult, $7.50; child (3-11) $4.50.

Metro tickets — Passes, books and single tickets available.

Movie discounts: General Cinema, $4; AMC Theater, $3.75; Loews Theater, $4.

Entertainment '93 and Gold C coupon books, stamps, Walt Disney Club memberships also available.

Upcoming events: EAA Christmas Tree Sale, Dec. 5.

EAA Christmas dances: Dec. 11 and 12.

EAA Children's Christmas party: Dec. 19

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

Weight Safety — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. Nov. 19. Pre-registration is required; cost is $5.

Defensive driving — Course is offered from 8 a.m.-5 p.m. Dec. 12. Cost is $19.

Aerobics — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is $32 for eight weeks.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is $24.

Bench aerobics — Class meets from 5:16-6:15 p.m. Mondays and Wednesdays. Cost is $32 for eight weeks; participants must provide their own benches.

Aikido — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is $15 per month.

Fitness program — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed exercise program. Call Larry Weir, x30301.

Country and western dance — Beginning class will meet from 7-8:30 p.m. Mondays for six weeks beginning Nov. 2. Intermediate class meets from 8:30-10 p.m. Mondays. Cost is $20 per couple.

Flag football — Men's flag football registration will be at 7 a.m. Nov. 9 at the Gilruth. Mixed league sign-ups will be at 7 a.m. Nov. 10.

Volleyball — Winter league volleyball registration will be at 7 a.m. Dec. 8-9 at the Gilruth. Mixed C and women's leagues will sign up on Dec. 8. Mixed "B" and men's leagues will sign up Dec. 9.

Basketball — Winter league basketball registration will be at 7 a.m. Dec. 10 at the Gilruth.

JSC

Dates & Data

Today

Health Fair — The JSC Human Resources Office will sponsor a Health Fair from 9 a.m.-4 p.m. Nov. 13 in the Gilruth Center ballroom. Health care representatives will present their 1993 benefit packages to assist employees in making open-season changes. Open season runs from Nov. 9-Dec. 14. For more information, call x32681.

Cafeteria menu — Special: Salisbury steak. Entrees: baked scrod, broiled chicken with peach half. Soup: seafood gumbo. Vegetables: cauliflower au gratin, mixed vegetables, buttered cabbage, whipped potatoes.

Monday

STS-52 briefing — The crew of STS-52 will brief employees on its recent mission at 1 p.m. Nov. 16 in Teague Auditorium. All employees are encouraged to attend as their work loads permit.

Cafeteria menu — Special: beef and macaroni. Entrees: ham steak, Parmesan steak. Soup: chicken and rice. Vegetables: green beans, carrots, au gratin potatoes.

Tuesday

BMC meets — The Bendix Field Engineering Corp. Management Club will meet at 4 p.m. Nov. 17 at the Gilruth Center. Jack Lister will discuss the NASA Road 1 widening project. For more information, call Jerry Stoner at 482-3462.

Cafeteria menu — Special: Mexican dinner. Entrees: potato baked chicken, barbecue spare ribs. Soup: tomato. Vegetables: squash, ranch beans, Spanish rice, broccoli.

Wednesday

CLANG meets — The Clear Lake Area Network Group will meet at 7 p.m. Nov. 18 at the South Shore Harbour Country Club. David Moore of David Systems will discuss Simple Network Management Protocol. Cost is $12 for members, $13 for non members. Reservations are due by noon Nov. 13; call Pat Adams at 338-5807.

Astronomy Seminar — JSC Astronomy seminars will host an open discussion luncheon meeting from noon to 1 p.m. Nov. 18 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

Toastmasters meet — The Spaceland Toastmasters Club will meet at 7:15 a.m. Nov. 18 in the Bldg. 3 cafeteria. For more information, call Darrell Boyd at x36803.

SBR meets — The Texas Space Business Roundtable Houston Chapter will meet at 11:30 a.m. Nov. 18 at the University of Houston Hilton, 4800 Calhoun. David Rossi, vice president of Spacehab Inc., will discuss Spacehab program details. Cost is $18 for members, $23 for non-members. Reservations are due Nov: 16; call Brian Barnett at 280-0460.

Cafeteria menu — Special: baked meatloaf with Creole sauce. Entrees: baked scrod, liver and onions, ham steak. Soup: seafood gumbo. Vegetables: beets, Brussels sprouts, green beans, whipped potatoes.

Thursday

Cafeteria menu — Thanksgiving special: Turkey and savory dressing, ambrosia salad, giblet gravy, cranberry sauce, Italian green beans almondine, candied yams with marshmallows, roll and butter, apple and mince cobbler. Entrees: chicken and dumplings, corned beef with cabbage. Soup: beef and barley. Vegetables: spinach, cabbage, cauliflower au gratin, parsley potatoes.

Nov. 20

Small Business Expo — JSC will host a Small Business Expo from 9 a.m.-2 p.m. Nov. 20 at the Gilruth Center. The expo is designed to create new markets for suppliers and new sources for buyers and JSC organizations. For more information, call Barbara Kirkland at x34512.

JAS meets — The JSC Astronomical Society will meet at 7:30 p.m. Nov. 20 at the Lunar and Planetary Institute, Bay Area Blvd. and Middlebrook Dr. Rich Nugent and Paul Maley will present "Solar Eclipse Reports." For more information, call Chuck Shaw at x35416.

Cafeteria menu — Special: tuna and salmon croquette. Entrees: pork chop with yam rosette, Creole baked cod. Soup: seafood gumbo. Vegetables: Brussels sprouts, green beans, buttered corn, whipped potatoes.

Nov. 24

Blood drive — The fourth on-site JSC Blood Drive of 1992 will be from 8-11:30 a.m. and 1-3:30 p.m. Nov. 24 at the Gilruth Center. Appointments are required; call Mary O'Rear at x36531, or Dan Mangieri at x33003. For more information, call Mangieri at x33003.

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. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: Sageglen, 4-2.5-2, 3007 sq ft, corner lot, 2 story, circular staircase, 2 wet bars, blk paneled gameroom, storm windows, solar screens, sec sys, $139.9K. x37760 or 481-4190.

Sale: Sageglen, 4-2-2; 2154 sq ft, cathedral ceiling, new carpet, track lights, wet bar, fans, security sys, $82.4K. x37760 or 481-4190.

Sale: Countryside, 3-2.5-2A, 2 story, lg corner lot, cov deck, all BR up, int util rm, CCISD, $65.9K. 554-7623.

Lease: Pipers Meadow, 3-2-2, formal, storm windows, patio, door opener, FPL, pets ok, $795/mo. + dep. 486-5527.

Lease: Heritage Park, 3-2-2, formal dining, breakfast area, fenced, patio, cul-de-sac, no pets, refrig, $695/mo. 482-6609.

Sale: LaMoca, Hwy 83, Webb County, 71 acre ranch, 2 deer blinds, 2 deer feeders, 2 BR house on 9' stilts, water well, elec, mineral rights, $120K. 326-1833.

Lease: League City, 4-2-2, formals, FPL, fenced, no pets. x31440 or 333-5693.

Sale: Friendswood, lux French country estate, 4-3.5-3D, 3478 sq ft, located on 5.7 acre, another 5.3 acre avail, $365K. x39250 or 996-8471.

Rent: Galv beach house, D/W, cent air, furn. Ed Shumilak, x37686.

Sale: Galv beach house, 3-2-1, CA/H, furn. Ed Shumilak, x37686 or 326-4795.

Sale: Nassau Bay condo, 2nd fl, elevator, W/D, balcony. 663-6526.

Sale: CLC, 1-1 condo, W/D, refrig, alarm, FPL, owner moving, $26.9K OBO. 280-9740.

Sale: SW Houston, 2-2 condo, W/D, refrig, lg patio, FPL, $29.9K. 280-9740.

Rent: Baywind II condo, 2-2, new carpet/lanolium/paint, no pets, no smokers, $525/mo. 486-8551.

Lease: 3-2-2, hdwd floors, FPL, fans, lg master BR, hot tub, deck, fenced, pets ok, $950/mo. 326-1155.

Rent: Galv condo, furn, sleeps 6, Seawall & 61st, wknd/wkly/daily. Magdi Yassa, 333-4760 or 486-0788.

Sale: CLC, 3-2-2, cul-de-sac, formals, den, 10' ceilings, wetbar, Italian tile, no approval, $118K. x35926 or 486-7475.

Sale: Clear Lake Shores, 3-2-3, wooded lot, 2-story, FPL, gameroom, loft, ext decks, new carpet/vinyl/paint/appl, boatslip, $129K. 538-1849.

Sale: South Shore Harbor, 5-3.5-2D, new carpet/paint, upgrades, lg pool sz golf lot, $224.9K. 334-2734.

Sale: Meadowgreen, 2-story, 4-3-2, 1BR up, gameroom, storm shutters, new paint in, new vinyl floors, landscaping, oversized lot, $108K. Janet, x35295 or Randy Barr, 333-1700.

Lease: Meadowbend, 3-2-2, new paint/carpet, storm windows, fans, new appl, storage shed, garden, $825/mo. + dep. 334-5898.

Cars & Trucks

'90-92 cloth split bench seat for Chevorlet full sz truck, garnet red will replace vinyl or standard cloth seat in ext cab or regular cab, $400. Gary, x39552 or 480-4990.

'82 Pontiac Firebird, blue, V6, 70K mi, AC, auto, good cond, $2250. Greg, 333-2699.

'85 Pontiac 6000LE, 4 dr, all pwr, cruise, AC, ex int, new trans, $2.5K. 943-5416 or 992-3022.

'89 Bronco, Eddie Bauer, new goodyears, new muffler, tailpipe, batt, auto overdrive, 52K mi, ex cond. 480-7999.

'84 Cadillac, Sedan DeVille, dk blue w/landau roof, 4 DR, V8, AC, tilt, cruise, AM/FM stereo, 86K mi, ex cond, $3.7K. 538-1107.

'88 Corvette, blk w/gray leather int, loaded, auto trans, tint, alarm, new Michelin tires, ex cond, 50K mi, $18.5K. x34431 or 338-1169.

'86 Cavalcade LXE, 25K mi, loaded, extras, $6.5K OBO. 554-6465.

'68 Mustang, red, body & int need work, good tires, good cond, $1.2K. 337-4182.

'89 Toyota PU, metallic blue, tinted windows, bedliner, alarm sys, 4 spd, 50K mi, stereo/cass, $6.3K negotiable. 333-8047 or 286-7046.

'91 Chrysler Lebaron Coupe, red, auto, alarm, 33K mi, 2.3L eng, cruise, $8.5K negotiable. 333-8047 or 286-7046.

'91 Jeep Renegade, hardtop, AC, loaded, 7 yr warr, 9K mi, $16.9K. 283-5863 or 534-4958.

'84 Chevy truck, C10 Longbed, 6 cyl, manual 3 spd, new carb, exhaust sys, $1.8K. Jim, 335-2539 or 474-2368.

'78 Porsche 928, brwn w/leather int, auto, ex cond, 75K mi, $8.5K OBO. Bill, x39980.

'89 Dodge Shadow, red, auto, turbo, power equip, sunroof, cruise, spoiler, new tires, $6750. Dick, 486-9770 or 488-2716.

'63 Corvette, split window coupe, red, factory AC, 4 spd, pwr windows, $21K. x38843 or 332-6153.

'78 Corvette, wht w/doeskin int, glass tops, low mi, ex cond, $5.9K. 532-2374.

'90 Nissan 240SX, loaded, orig owner, perfect maint record, new tires, alarm, $10.9K OBO. Bryan, 944-2155.

'81 Chevy truck, new mags, tires, $2850. 326-2280.

'90 Toyota 3/4 ton PU, 4 cyl, auto w/Od, AC, AM/FM/cass, $7.8K OBO. x33606 or 409-925-8092.

'83 Porsche 911 Coupe, gold w/brwn leather, 127K mi, good cond, $14K. Gary, x33786 or 499-5786.

'85 Chevy Corvette, auto, targa top, new saddle int, new 16" tires, 69K mi, digital dash, ex cond, $9.9K OBO. x38785 or 409-948-4887.

'78 Chevy Big 10 PU w/camper shell, 454 cyl eng, 400 auto trans, AC, $1.8K. Mark, x38013 or 992-4132.

'91 Honda Civic LX sedan, AC, AM/FM/cass, pwr locks/windows, tint, $9995 negotiable. Jeff, 283-4175 or 451-0361.

'86 Pontiac Grand Am, V6, auto, 4 DR, tilt, cruise, new AC compressor, $3.3K. Jeri, 333-7552.

'74 Pontiac Grand Prix, needs some trans work, $495. Jerry, x30951 or 488-5553.

Boats & Planes

'78 Santana 20 sailboat, new 155, 100 & spinnaker, Johnson Sailmaster, trlr, knotmeter, compass, $4.3k OBO. 326-1782.

Mistral competition windsurfer, $550. Debbie, x32403 or 326-1415.

Sportsman galv tilting boat trlr, new tires, fits 15-16' boat, $200 OBO. Joe, 333-4743 or 409-945-9801.

Cycles

Boys 20" BMX bike, $20 OBO. 474-3553.

Audiovisual & Computers

Tandy EX100, 8088, no HD, 5.25 & 3.5 disk drives, CGA, 1200 bps modem, mouse, joystick, software, $200 OBO. Greg, 333-2699.

DesQView/X software, was $179, now $125 OBO. Gail, x32898 or 480-5814.

Zenith portable PC, 2 5.25 FD, 640K, 7" mono, standard serial, parallel, video outputs, $150; Panasonic KX1592 printer, wide carr, $150, both ex cond, both for $250. Speier, 333-2263.

Pets & Livestock

Mini-lop and fuzzy lop rabbits, Gailo, 554-6200.

AKC miniature Schnauzer's, 6 males, shots, wormed, $200/ea. Katy, 486-9750.

AKC Shih-tzu pups, born 9 19 92, 2 male, 1 female, blk & wht. Kim, x30651 or 286-5637.

AKC mini Schnauzers m/f, $150-175. 922-7240.

Musical Instruments

Portable, programmable organ, WERSI DX350T digital, 2 kybds, pedals, rhythm, sequencer, voicing, tapes/disks, bench, C64 computer sys, software, books, was $11K, now $3K or trade. 339-2829.

Drum set, incl hi-hat, cymbals, bass, 3 toms, ludwig snare, sticks, brushes, $300. Robert, x35258 or 482-0374.

Alto saxophone, needs work, $75 OBO. 339-2056.

Lost and Found

6 spd Raleigh bike missing or stolen from Mission Control Center, If you see it, call Jon Axford, x37671.

Household

17" color tv, blk matrix monitor, cable ready, 134 channel, remote, stand, $185. Gary, x39552 or 480-4990.

2 30" tall oak bar stools, wicker backs, lt nylon seats, was $100/ea, now both for $125. 943-1694.

Full twin sz, solid oak bunk beds, good cond, $100. Gail, x32898 or 480-5814.

Teakwood table, 2 matching chairs, table has 2 pullout leaves, $50. Suzanne, 335-2896 or 286-1388.

Pine/glass top dining table, 4 chairs, $70; stereo cabinet, $30; 2-drawer desk, chair, $30; Bakers rack, brass/wood, $20. 532-1730.

Blk entertainment center, 5' x 6' x 4, glass doors, 2 shelves, 2 drawers, space for tv, $100 OBO. 335-0603.

King sz bed w/hardwood frame trimmed w/brass, spread, pillows, sheets, matt cov, ex cond, $225; keg refrig, 20 cu ft, w/icemaker, incl empty keg, gas bottle, hoses, $275. x39282 or 335-0641.

Super single waterbed, bookcase headboard, dbl drawer pedestal, matt, heater, 1.5 yr old, $65. Jeff, 283-5501 or 286-2060.

Norge 20 cu ft chest freezer, ex cond, $275. 333-2830.

Girls BR furn, desk, hutch, chair, 2 drawer nite stand, 7 drawer dresser w/mirror, ex cond, $250. x36090 or 488-7427.

Small china buffet/hutch, 72" x 17" x 30", dk veneer, glass insets, bottom storage, 1 drawer, ex cond, was $275, now $100. Janine, 283-7541 or 482-7550.

Honey Oak king waterbed, dbl etched mirror headboard, under dresser, dbl dresser, mirror, 2 end tables, extra matt, Carter 6 pc sectional w/matching travertime marble/glass table, ex cond, make offer. 286-3436.

China buffet, country French, off-white finish, $350. 992-5745.

French Provential furn, 6 drwr double dresser and night stand, $125. 554-4117.

Brass/wht full sz bed, headboard, 2 wooden twin sz head boards. 326-2307.

2 end tables, 1 behind couch table, $95; all leather/wood chair, $25; wicker baby changing table, $25. Stan, 339-1152.

Kirby vacuum w/attachments, $150; two bookcases, $50/ea. 482-8827.

Qn sz Simmons Beauty Rest matt, box spring, ex cond, $150. Melki, 480-4101 or 996-5088.

Wanted

Want Starwars spaceships, toys, figures and books. Ron, 482-1385.

Want STS-52 payload patches. LAGEOS, USMP-1, other STS-52 payload patchs, decals or lapel pins. Andrew, 280-0647.

Want small popup camper under 1K lb, must have good working AC, will pay up to $1.5K depending on model yr. 333-7010 or 482-5393.

Want to buy or rent during Christmas, dog kennel for transporting 50lb dog by commercial airline. Steve, 333-7819.

Want parents of infant to share nanny w/4 mo old baby boy in our home or yours. Denise, x31846 or 486-5146.

Want Appleworks version 3.0 for Apple IIE. 326-2307.

Want desk, wood, small sz 24" x 36" in good cond. Magdi Yassa, 333-4760 or 486-0788.

Miscellaneous

Wht wicker hdbd, dbl full sz, $35; silver maple trees, $1/ea. 943-1694.

Theater Under the Stars, Christmas Show, 1st row, center stage, balcony, Sat, Dec 12, 2:00 pm, $33/ea. Suzanne, 335-2896 or 286-1388.

Engagement ring, 18 k yellow gold, round dia solitaire, .68 carets w/6 round dia, was $1.5K, now $1K. x30874.

John Deere 5 x 95 38" riding mower, 120 eng hrs, was $2.5K, now $1350. 333-2830.

Sears extra long, 33 x 80, sleeping bag, Dacron Holl-fil 808 insulation, good cond, $17. 337-3973.

'91 Jayco 18' popup, sleeps 6, shower/toilet, air, was $8.9K, now $6590. 283-5863 or 534-4958.

Sears bicycle child carrier, $10. 282-4078.

Designer wedding gown, wht satin/schiffli lace, victorian neckline, renaissance sleeves, cathedral train, matching finger-tip length veil, sz 8-10, was $950, best offer. 488-6758.

Friends Fly Free ticket to Kansas City, Hobby - Kansas City, Dec 24, 4:00 pm, return Jan 2, 1:00 pm, $150. Marcia, x30195 or 486-1844.

4 Chevrolet 15" Honeycomb cast alum wheels, off of '92 S10 Blazer w/4K mi, $50/ea. Tom, x36910 or 286-7001.

Decorated Christmas tree, lights, loaded, $95; set of Mexican glassware, pitcher w/8 glasses, $40. Stan, 339-1152.

64' ham radio tower, $200 OBO; solid wood baby bed, qn sz water bed, 15 gal aquarium w/accessories. Brian, x32884 or 334-5045.

Wht foxtail jacket, $150; ladies Judy Rankin golf clubs, bag, woods, irons, putter, wedge, shoes, sz 8, $150. 326-1010.

Weslow cross training system, similar to Soloflex w/stair stepper, 180 lbs of bands, $175 OBO. Kelvin or Mary, x35909 or 488-8173.

Camper shell on '70 Chevy C10 truck, ex cond, $250. Fred, 944-3523.

30-06 Remington 700 ADL bolt action rifle w/3-12x40 mm Taso Scope, $350; 12 ga Remington Model 870 Wingmaster pump shotgun, 30' full choke, $250. Raul, x39394 or 484-6814.

Norton Ditto men's gray pin stripe suit, 46 long 34 wide, $50; stationary bike, $30; rattan all wood bedside tables/mirror, $75 OBO on all items, x38486 or 482-6109.

Sears ladies 10 spd bike, $60; 2 full sz Ford van bench seats, $50; camper top for small shortbed PU, $100 OBO. x38486 or 482-1609.

Turbo Graphics game system + 2 games, $90. Greg, 554-6200.

Kenmore zigzag sewing machine w/cabinet, $50. Myrle, 333-3700.

President and First Ladies Gold Charter Membership, $600 OBO. Anne, 488-7036.

Elec organ w/bench, music books, ex cond, $250 OBO; IBM Selectric correcting typewriter, ex cond, $200; round porcelain sink, $30; men's bike, $100. 280-2368.

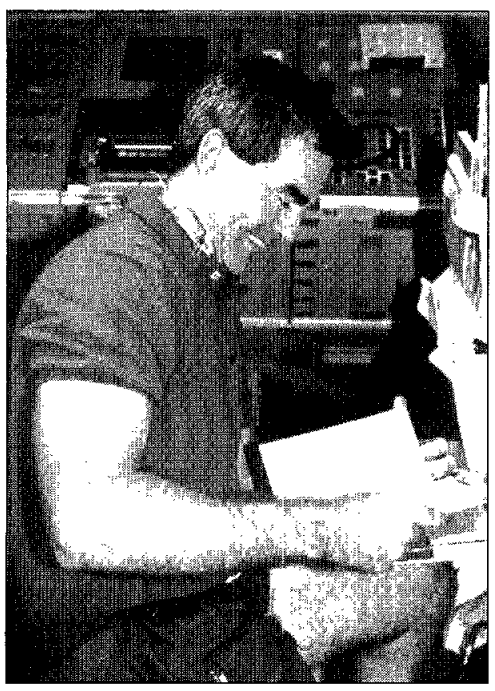
Spare tire w/rim, 4 bolt pattern, $30 OBO; tool box, for mid sz truck w/lock, $100 OBO. Youm, 283-4813.

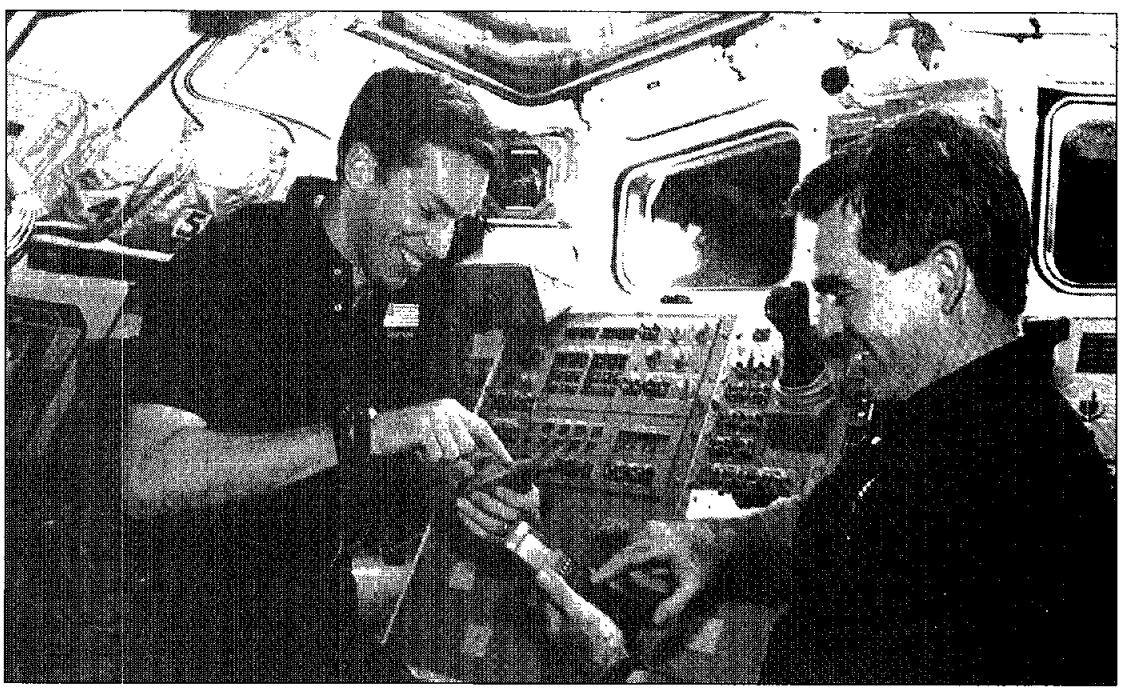
American flag w/mount, $19; survival knife, $12; mechanical drawing set, $9; red bear bow and arrow set, $19. 482-8827.

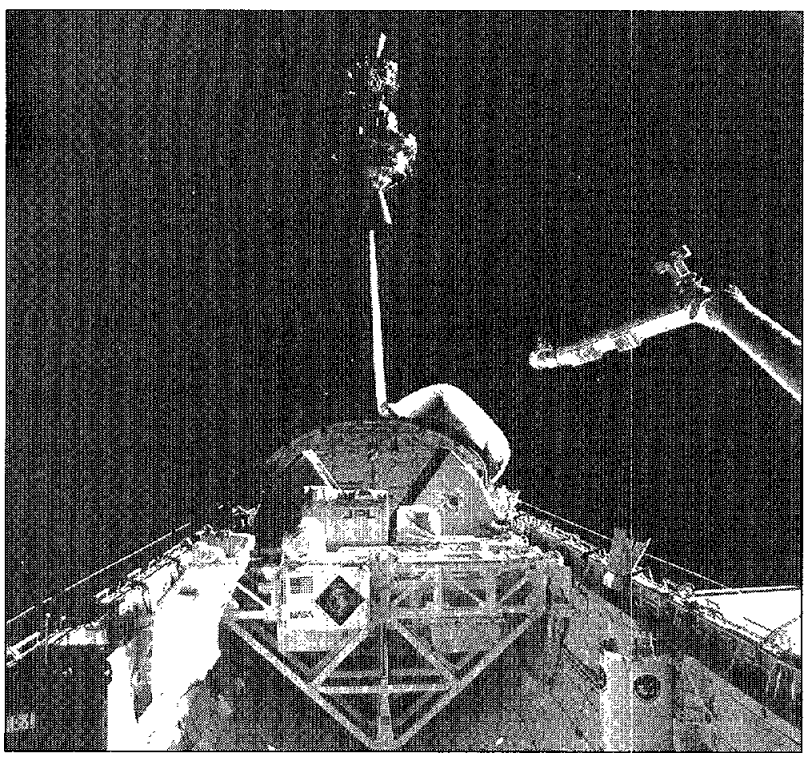
Popup camper by Scamper, $800 or trade for small boat and rig. 339-1402.

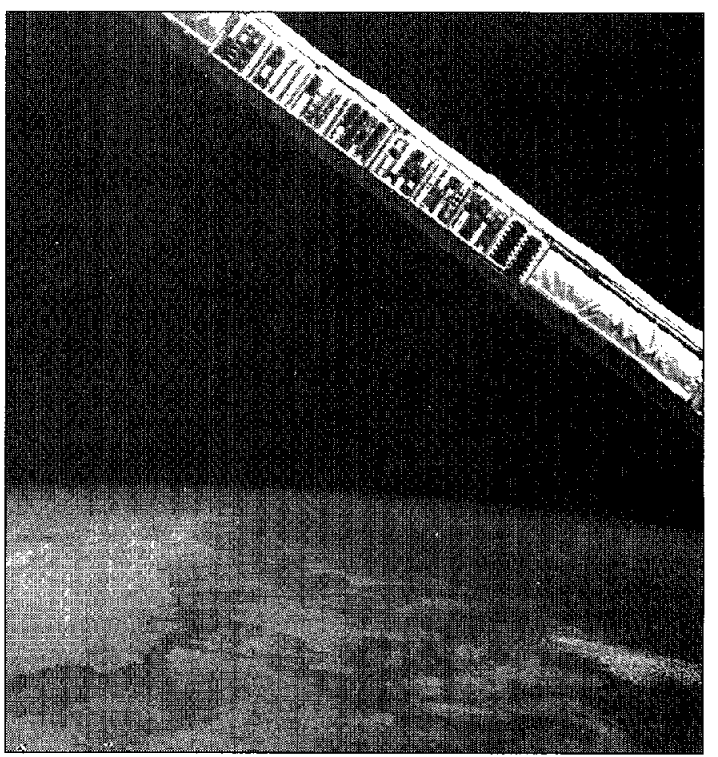
Indoor Whirlpool tub, 4 x 5, almond, $300. Mark, x38013 or 992-4132.

Plexiglass carpet protector, 54" long, 38" wide. x36080.









Ten Busy Days

STS-52 crew returns photos from non-stop science flight

The crew of STS-52 is back home after a 10-day flight to deploy a satellite that will help chart the movements of the Earth's crust, test a machine vision system that should be a valuable tool during Space Station *Freedom* assembly and continue shuttle experiments in materials processing and human physiology.

Scientists already are busy studying the raw data from the experiments, as well as the photographic records.

The crew will present a briefing for employees, featuring still photographs, film and video, at 1 p.m. Monday in Teague Auditorium.

Clockwise from top:

1) The STS-52 astronauts pose on the aft flight deck for their crew portrait. From left are Mission Specialist Bill Shepherd, Commander Jim Wetherbee, Mission Specialist Tammy Jernigan, Payload Specialist Steve MacLean, Mission Specialist Lacy Veach and Pilot Mike Baker.

2) Jernigan and Baker use the overhead windows on the aft flight deck to view and photograph Earth. The same windows were used to conduct operations with the Laser Geodynamics Satellite-II and the remote manipulator system during tests of the Space Vision System.

3) Wetherbee and Veach compare instruments from different eras to demonstrate the advancement of technology. As Veach uses a modern calculator, Wetherbee pretends to calculate using an ancient adz, a cutting tool with a thin arched blade used by the Polynesians to build dugout canoes that charted a large portion of the Pacific Ocean as early as 3,000 years ago.

4) With a backdrop of eastern Egypt below, the Canadian-built remote manipulator system displays a Canadian Space Agency experiment called Materials Exposure in Low-Earth Orbit. MELEO was one of a number of Canadian experiments that flew aboard *Columbia*. Plastic and composite materials used on the external surfaces of spacecraft have been found to degrade in the harsh environment of space. Evidence suggests that the wear is caused by interaction with atomic oxygen, which induces chemical and physical reactions that reduce the mass, strength, stiffness and stability of size and shape. MELEO exposed more than 350 material specimens mounted on witness plates on the robot arm. MELEO Principal investigator is Dr. David Zimick of the CSA.

5) Laser Geodynamics Satellite-II rises out of its thermal shield in the aft portion of *Columbia*'s payload bay during deployment.

6) Veach refers to notes in order to respond to questions from ground controllers about one of a myriad of experiments that flew on STS-52.

7) MacLean tries out gymnastics in the weightlessness of space on *Columbia*'s aft flight deck as the banner of the Canadian National Gymnastics Team hovers nearby. MacLean, an accomplished laser physicist, was a member of the team in 1976 and 1977. ❑

NASA, EPA agree to step up cooperative efforts

NASA Administrator Daniel Goldin and Environmental Protection Agency Administrator William K. Reilly have signed an agreement to broaden cooperation between the two agencies.

The agreement pledges each agency to share information and facilities. It enables the exchange of personnel and joint development of research plans and projects.

Subjects of likely cooperative activities include Earth and environmental science and measurements, pollution monitoring, global climate and environmental change, technology transfer, and aerodynamic and fuel efficiencies.

"This agreement renews NASA's commitment to safeguard the planet on which we live and to employ its technical expertise and experience to help solve problems here on Earth," Goldin said.

EPA Administrator Reilly said, "I look forward to collaborating with NASA on environmental research and technology development. This agreement is going to bolster EPA's on-going efforts to monitor the health of our natural resources and the ecological systems that sustain us."

"EPA's Environmental Monitoring and Assessment Program, for example, will especially benefit from this agreement. Our scientists use satellite imaging to secure the data we need to evaluate environmental conditions and trends, the effects of pollution and other information critical to making better decision," Reilly added.

Agreement on specific cooperative activities will be detailed in the "Implementing Arrangements" authorized by the memorandum of understanding signed today.

The first implementing arrangement is being drafted by scientists of the two agencies. In conjunction with NASA's Mission to Planet Earth and EPA's Environmental Monitoring and Assessment Program, the two agencies will establish a Joint Technical Working Group to identify and recommend projects in Earth and environmental science and measurements. These projects could address global environmental monitoring.

JSC Photo by Jack Jacob

SHARP WATER—JSC employees check out the "water knife" in the Bldg. 10 sheet metal shop during last week's Technical Services Division open house. Visitors kept both Bldg. 9 and 10 full the entire day. The water knife uses a high pressure stream of water at 45,000 pounds per square inch to cut patterns in a multitude of materials, including steel, aluminum and glass. The precise, computer driven machine can cut through steel up to 6 inches thick. One of its many tasks has been to cut out sections of space shuttle windshields for analysis. Fred Winter of the Sheetmetal and Welding Section manages the operation of the machine.

JSC Clinic offers new cancer detection tool

Prostate cancer rates continue to rise in the United States, but the JSC Clinic has a new tool at its disposal that can help detect these tumors when they are small and most curable.

The clinic now is authorized to perform the prostate specific antigen test, a tumor marker specific for prostate cancer. The blood test will be done as part of the health screening examination for men 50 and older. It does not replace the digital examination of the prostate.

About 130,000 cases of prostate cancer are expected this year in the U.S., and 30,000 men will die from the disease. This represents an increase of about 8 percent over the previous year.

A number of risk factors have been associated with the occurrence of prostate cancer. The first is age; rare in men under 40, prostate cancer occurs most frequently in men over 50. Race is the second variable; black men in the U.S. have the highest death rate worldwide — 60 per 100,000—and white men also are subject to a very high death rate —40 per 100,000. Oriental men in the U.S. have a low death rate—just 2 to 4 per 100,000—but it is still higher than for oriental men who live in the Far East. A family history of prostate cancer is another risk factor, and high fat, low fiber diets also have been implicated.

Medical specialists report that by using a combination of the PSA test, digital rectal examinations and ultrasound of the prostate, most cases of prostate cancer can be detected early.

For more information, call the clinic at x34111.

Panel urges flexible satellite rescue pricing

(Continued from Page 1)

"We estimated that only 1 percent of the total satellites to be launched in the next few years will be candidates for rescue and repair," Covert said.

While the trend is for smaller satellites that do not require on-orbit maintenance, the group did say the shuttle should continue to support those science payloads designed to be serviced, such as the Hubble Space Telescope.

The report says that if NASA charged customers the full cost of a shuttle mission, the economic benefit to the manufacturer, owner or insurer "would be greatly diminished."

The report urges NASA to keep its satellite rescue pricing policy broad enough to accommodate U.S. government agencies and commercial enterprises as well as international government and commercial clients. Covert said the group recommends a pricing approach that would vary depending upon the customer.

The task force recommends that non-NASA U.S. government customers pay marginal costs which NASA defines as the cost of adding or deleting one mission from the manifest. Reimbursable customers (commercial and international) should pay the marginal cost as well as any up-front costs.

"In addition to the marginal and unique costs, we recommend that if the mission is a success, NASA should receive a negotiated portion of the revenues until the full cost of the rescue is paid," Covert said.

The task force said NASA should continue to ensure that safety requirements are met for all satellite rescue and repair missions.

"We note in the report the Intelsat rescue mission did not have a mission manager," Covert said. "We recommend a mission manager be named as soon as NASA has accepted a mission, and this person should be responsible for all aspects of preflight mission execution."

Covert said one of the most important findings that came out of the study was the risks of performing these types of missions. The committee recommended NASA remind the public of the risks associated with rescue missions.

"There may be times in the future when NASA is not successful in rescuing and repairing a satellite. That does not mean the total, overall shuttle flight was a failure," he said.

NASA to apply tethered satellite lessons

(Continued from Page 1)

deploying the satellite."

NASA previously had reported on Aug. 28 that the cause of the unplanned stops at 587 and 840 feet was a mechanical obstruction—a protruding bolt—which prevented part of the tether reel mechanism from moving across its full range of travel.

"We contacted the bolt when the satellite was out at 587 feet," Branscome said. "What we learned from our ground simulations was that in spite of the bolt obstruction, it was possible to pull additional tether off the reel, out to 840 feet."

"The board made some excellent recommendations in the report on how to deal with things like late changes to the hardware," NASA Associate Administrator for Space Flight Jeremiah Pearson said. "We are going to look carefully at their recommendations and apply the lessons learned from this flight to future missions."

No plausible scenario has been validated post-flight regarding difficulty in retracting one of two umbilicals between TSS and its deployer.

Based on its findings, the board recommended several specific hardware assessments and modifications which should be made to other elements of the tethered system if NASA decides to refly it.

Penny gets wise about pound foolishness

(Continued from Page 1)

use, our U.S. system of measurement has become perplexing when it comes to describing force and mass, mass and density. Both are frequently described in "pounds," but without any distinction made.

Penny: Now I'm more confused than ever.

Sir Isaac: It's practical for you to describe your body mass as 130 pounds, since gravity and other conditions are fairly constant around you. But with laboratory samples or materials in space, the conditions of gravity, temperature and pressure can vary greatly. Scientists need a term that will describe the same substance no matter how the conditions around it change.

Penny: That I can understand.

Sir Isaac: One advantage in NASA's switching to the international metric system is that it is relatively pure and uncluttered in its distinction between mass and mass-affected-by-gravity. In this system, the unit of mass is the kilogram and the unit of force is the newton.

Penny: Well then, under the metric system how much would I weigh?

Sir Isaac: Strictly speaking, you wouldn't weight anything, since you haven't specified whether you are referring to mass or mass-affected-by-gravity, called "force." In a laboratory, this distinction is essential, otherwise the measurement will be ambiguous.

Penny: Then what is my mass?

Sir Isaac: Your 130 pounds would be converted to 59 kilograms.

Penny: 59 sounds better than 130!

Sir Isaac: What you ordinarily refer to as "weight" depends upon the acceleration due to gravity and varies from point to point in space. Here on Earth, your pound force would be 573.2 newtons. That's 59 kilograms times 9.8 meters per second squared, or acceleration due to the force of gravity. On the Moon, your pound force would be 95.5 newtons.

Penny: Mass and force, kilograms and newtons — I can see why metric is more exact.

Sir Isaac: Well, so much for the science lesson. How about a snack?

Penny: You know my diet. I brought my own—a fig newton.

Four JSC employees earn awards for their innovative suggestions

Four JSC employees recently received significant monetary suggestion awards from JSC Acting Director Paul J. Weitz.

Burt A. Laws of Engineering's Facility Projects Section received $2,800 for development of a radiometer base unit.

Malcolm E. Jones of Engineering's Navigation Section earned $2,495 for a suggestion to delete inertial measurement unit calibration during Vandenberg Air Force Base launch orientations.

E. Ray Hischke of the Orbiter and GFE Projects Office's Flight Data and Evaluation Office received $1,250 for a suggestion on the Kennedy Space Center Gas Mask Course.

And George Dickey Arndt of Engineering's Electromagnetic Systems Branch received $825 for cost savings to a Lockheed Engineering Co. contract.

Numerous other productivity, NASA Tech Brief and patent application awards also were presented during the October ceremony.

NASA Weather Team earns recognition

The NASA Weather Team, which includes the National Weather Service's Spaceflight Meteorology Group at JSC, recently earned NASA's Manned Flight Awareness Team Award.

The award, which cited "outstanding weather support to all phases of shuttle operations including ground processing, launch, on-orbit, safe recovery and ferry flight, was presented to all members of the NASA Weather Team, including those at JSC, Cape Canaveral, Edwards Air Force Base, White Sands Space Harbor and NASA Headquarters.

The plaque, presented by Astronaut John Blaha, contains a flag flown on STS-49, the maiden flight of the Space Shuttle *Endeavour*.

Jefferson named top minority contractor

A JSC contractor—Jefferson Associates Inc.—recently was named Minority Contractor of the Year by the City of Houston.

JAI, a minority-owned and operated enterprise that offers imaging and document management system and general personal computer information technology, has contracts with JSC's Space Shuttle Program Control Office, Business Management Office, New Initiatives Office and the Orbiter and GFE Projects Office.

The 18-year-old corporation, headquartered in the Clear Lake area, employs 65 people. It also has contracts with the City of Houston, including a major contract to convert 4.5 million documents from hard copy to electronic images.

Space News Roundup

The **Roundup** is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

Dates and Data submissions are due Wednesdays, eight working days before the desired date of publication.

Editor .....Kelly Humphries
Associate Editor .....Kari Fluegel

Child Care Center plans toy, book fairs

Holiday preparations are already starting at the JSC Child Care Center.

The center will host its annual toy and book fairs again this year.

The toy fair, featuring Discovery toys, will be from 4 to 6 p.m. Wednesday at the Child Care Center.

Sally Jordan of Jeremy's Bookshelf will kick off the book fair at 5 p.m. Thursday with a presentation on "read aloud" books. Books will be available until 6 p.m. Thursday and Friday at the Child Care Center.

For more information, call Georgia Strain at x34734.