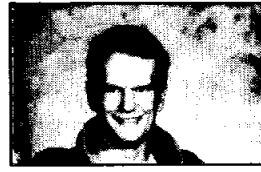




It takes a lot of hard work to make sure the JSC awards you earn are accurate and on time. Story on Page 4.



Veteran Astronaut Bo Bobko, the only person to fly on two Space Shuttle maiden voyages, is retiring. Story on Page 4.

# Space News Roundup

Vol. 27

November 11, 1988

No. 37

## Grand opening gives glimpse of JSC's future

By Pam Alloway

Balloons, colored lights and a jazz band whose snappy music soared to Bldg. 9B's 75-foot high ceiling heralded Wednesday's grand opening of the newly constructed Space Station Mockup and Trainer Facility.

About 800 invited guests and employees crowded into 9B for the ceremony and hundreds more toured the full-sized mockup of Space Station *Freedom* during Wednesday's open house.

"Welcome to building 9B and welcome to this glimpse of our future in space," JSC Deputy Director Paul J. Weitz told the crowd. "This is a momentous day not only for JSC but for the agency and the program."

During his brief speech, Weitz cited three recent milestones: the return of the shuttle system to safe flight; NASA's 30th anniversary; and Congress' recent passage of the \$11.2 billion NASA authorization bill that included a \$900 million allocation for the space station.

Clarke Covington, manager of the Space Station Projects Office, also spoke to the crowd and stressed the importance of integrating the space

station with other existing training programs.

"This is a major milestone designed to be operational for at least 30 years," Covington said.

The opening of 9B marks the first in a line of new facilities JSC plans to open in the next few years, Covington said. Other new construction will include a trainer in Bldg. 5, an expanded control center in Bldg. 30 to monitor the space station, and a second addition to Bldg. 9 that will house equipment and controls for verification of the engineering and assembly of the space station in orbit. Future plans also call for a neutral buoyancy building that will replace the Weightless Environment Training Facility and enclose 12.5 million gallons of water.

The building addition encompasses 21,250 square feet in the high bay area and 6,000 square feet of technical support area. Prime contractor was Valcon 2 Inc. The addition cost about \$3.5 million and the mockup and trainers cost about \$1.3 million, said John Trebes, manager of the Space Station Mockup and Trainer Facility.

## STS-26 crew to share flight experiences with employees

STS-26 crew members Rick Hauck, Dick Covey, Dave Hilmers, Mike Lounge and Pinky Nelson will discuss their flight experiences with JSC civil service employees on Monday.

The briefing, which will include a film and slide show created from mission photography, will begin at 10:30 a.m. in the Bldg. 2 Teague Auditorium. The crew will make a 30-minute presentation, and then answer questions from the audience for about 15 minutes, Hauck said.

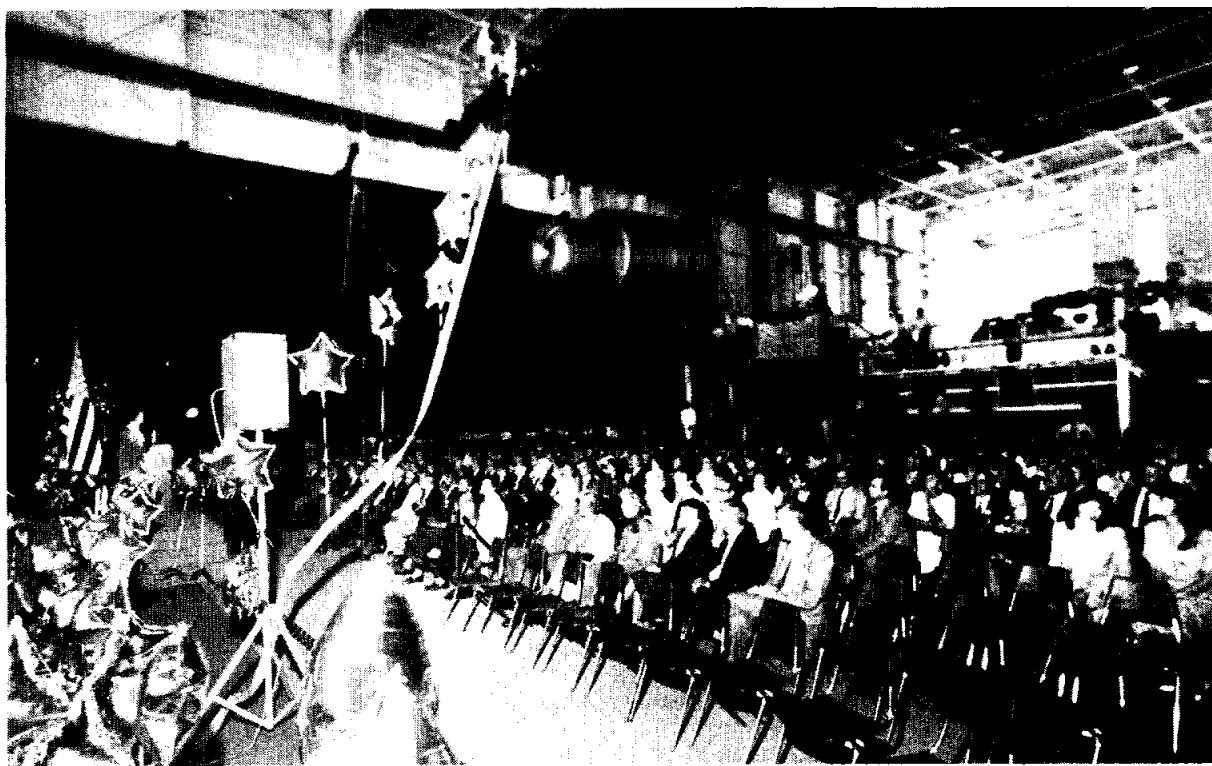
"This will give us an opportunity to extend our thanks to NASA employees

for helping us make the STS-26 mission a success," Hauck said.

Dan Nebrig, executive assistant to JSC Director Aaron Cohen, said supervisors are encouraged to allow as many employees as possible to attend.

"This is to give our employees a chance to hear first-hand about the experiences of the crew," Nebrig said.

The activity also will be carried live on the JSC closed-circuit television system, but employees are encouraged to attend the briefing in person.



JSC Photo by Benny Benevides

Star-shaped balloons carry cut ribbons aloft Wednesday in the new Bldg. 9B Space Station Mockup and Trainer Facility. JSC Deputy Director P.J. Weitz, Space Station Projects Manager Clarke Covington and Life Sciences Director Carolyn Huntoon cut the red, white and blue ribbons at the grand opening.

## Flight readiness review begins Tuesday

## Atlantis crew ready for 'dry count'

By James Hartsfield

The crew of *Atlantis* is scheduled to board the spacecraft this weekend to go through a dry countdown test with the Kennedy Space Center launch team.

As of Wednesday, the Terminal Countdown Demonstration Test (TCDT) was scheduled to begin at 6:40 a.m. CST Sunday with the count picking up at T-minus 24 hours. The test was planned to conclude at T-minus zero at 10 a.m. CST Monday. The STS-27 crew was to arrive at Kennedy on Saturday to begin preparations.

On Tuesday, the day after the TCDT is completed, a flight readiness review is scheduled to begin at Kennedy. Following the two-day review, a firm official launch date will be set. But, as of Wednesday, there were no apparent problems with any systems to stand in the way of a launch no earlier than Nov. 28.

Since it was rolled out to Launch



**STS-27**

Pad 39B on Nov. 1, the Shuttle has been undergoing a variety of final fueling and testing operations. An "all-systems test" of the solid rocket boosters (SRBs) Nov. 4 simulated in-flight events to verify the SRBs' on-board systems. Following that test, pad workers began loading *Atlantis'* forward and aft reaction control systems with hypergolic propellants, fuels that ignite on contact with one another.

By Monday, the storage tanks had been filled with the propellants, nitrogen tetroxide, the oxidizer, and monomethyl hydrazine. The tanks for *Atlantis'* two orbital maneuvering system engines also had been filled.

Technicians also loaded hydrazine into the Orbiter's three auxiliary

power units (APUs) and into the SRBs' hydraulic power units (HPUs). The Orbiter's APUs provide the power for the hydraulics that operate the aerodynamic surfaces of *Atlantis*, for example, the rudder and elevons. The SRBs' HPUs provide power for the hydraulics that allow the rockets' nozzles to move and make adjustments during flight.

Following their fueling, *Atlantis'* APUs were "hot-fired" for seven minutes in a test required to prove their performance prior to flight. During the test, a valve on APU Number 2 failed to close properly and engineers are evaluating the data to see if the part must be replaced.

Also, the solid rockets' HPUs were turned on for about 20 seconds to verify their performance.

The flight readiness review set for Tuesday and Wednesday is the final major milestone before launch, and the TCDT is the final major test before the start of the terminal countdown.



JSC Photo by Benny Benevides

Artificial intelligence engineer Laurie Webster, left, and software engineer Wanda Pratt, right, watch exercise physiologist Steve Siconolfi run on a treadmill that can decide whether he's working hard enough.

## Waging war against adaptation

JSC team fights effects of weightlessness

By James Hartsfield

A bicycle that can think for itself. Four healthy people confined to bed for more than four months. Six people who run on a treadmill inside an airplane flying a stomach-churning trajectory. And a group of 10 that exercises to music or selected videos, supervised by a computer.

All are soldiers, soldiers in a war declared against what historically has been one of man's most valuable assets—his natural, marvelous but troubling ability to adapt.

A team of scientists, doctors and engineers from a variety of areas at JSC is confident it will win that war, and that victory will allow humans living in space to remain as physically fit, or even more so, than they are on Earth.

"Man adapts in space. It's something that occurs naturally," explained JSC's Dr. Bernard Harris. "If we didn't want to come back to Earth, adaptation probably wouldn't be a problem. Our goal is to retard or prevent that adaptive process."

Harris heads a team of workers from various disciplines that is developing the Exercise Countermeasure Project. Exercise, Harris said, has already proven itself to be the most powerful weapon in the arsenal used to battle the effects of weightlessness on the body.

In weightlessness, muscles lose their strength, the

cardiovascular system becomes lazy, bones can degenerate. That process must be stopped if Americans are going to construct a space station in orbit, if they're going to live in zero-gravity and if Shuttle pilots are going to be fully fit to land their crafts after extended stays in space.

"We have to maintain the pilots' health so they're capable of flying down," he said. "Flying in the Shuttle is much more strenuous than Apollo; the crew is sitting up, not lying down. And they must have the strength to use the flight controls to successfully land." Also, there is no room for dizziness, a problem that could occur when gravity is first felt during a Shuttle descent.

Two main products are to result from the work now under way: an Exercise Countermeasure Facility for Space Station *Freedom* and an Exercise Countermeasure System for an extended duration version of the Space Shuttle that could stay in space for as long as 22 days. The Shuttle's exercise system will be different from the space station's facility mainly because of a lack of room aboard the Orbiter, Harris explained.

For America's space station, the exercise facility may have to be one of the first things in orbit. Astronauts involved in construction of the station will have to remain

Please see **BATTLE**, Page 3



JSC Photo

**Worker-Trainee Opportunities graduates recently received their certificates of achievement. From left are Felisha Drake, Danita Thomas, Melissa Pena, Racquel Demas and Yolanda Bejarano.**

JSC

## People

### Worker-Trainee grads receive certificates

Five JSC achievers recently received certificates of achievement at a graduation ceremony for the 15th Worker-Trainee Opportunities (WTO) Program. Felisha Drake, who worked in Space and Life Sciences' Flight Systems Branch, and Melissa Pena, who worked in Mission Support's Configuration Systems Section, were selected as WTO's of the Year and received \$400 Special Achievement Awards. Racquel Demas worked for Administration's director of procurement. Danita Thomas worked for the director of engineering, and Yolanda Bejarano worked for the

Management Integration Office.

### Alma mater names Pool distinguished alumnus

Dr. Sam Lee Pool, chief of the Medical Sciences Division at JSC, recently was selected by Southeastern Oklahoma State University as one of its Distinguished Alumni. Pool is a 1959 graduate of Southeastern with a bachelor of science degree in physics and has been honored by SOSU for distinguishing himself in the medical sciences field and bringing honor to the university. Pool entered the University of Oklahoma School of Medicine where he received his M.D. in 1963 and has been involved in manned spaceflight since 1968.

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 each.

AMC Theater (valid until May 31): \$2.95 each.

Sea World—San Antonio (year): children, \$13.56; adults, \$15.96.

JSC

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: Middlebrook, 3-2-2, study, FPL, wet bar, covered patio, large lot, ex. cond., FHA assumable 10%. 480-9363.

Sale: Seabrook, unique home and separate apartment w/lake view on heavily wooded 1/4 acre, \$86,500; adjoining 1/4 acre at \$18,000. 333-5821.

Rent: West Galveston beach house, 2-2, beach 100 yards, boat landing, marina w/pool, \$500/wk., weekend rates avail. Fendell, x31206 or 538-1147.

Lease: Nassau Bay 4 BR home on quiet street, approx. 2,200 sq. ft., FPL, 2-car garage, gas range, ceiling fans, no pets, \$800/mo. Jay, x32771 or 326-2316.

Sale: Chappell Hills, TX., 2.63 ac. in estab. historical community, 12 mi. from Brenham off Hwy. 290, \$18,435. Fred, (713) 480-7172.

Rent: Lake Livingston waterfront, 3-2, fully furnished, covered decks, pier, ex. fishing, swimming, skiing, new cond. 482-1582.

Rent: Furnished condo, 1-1-3, study, close to NASA, pools, tennis, jacuzzi, exercise room, TV, microwave, linens, dishes, \$450. 282-6422 or 488-7038.

Sale: 25 acres just off 517 between Alvin and Dickinson. \$5K/acre, owner finance with 25% down. 337-4051.

Sale: University Green patio home, several amenities, very nice, perfect for a bachelor executive, \$98,700. Bob, 488-0397.

Sale: Mobile home, 14' x 80', 3-2, FPL, wet bar, balcony kitchen, all drapes, appl., W/D. 480-8142 or 484-0858.

Sale: Alvin area, 3-1-1, brown brick house, 25 min. from NASA, well established neighborhood, 2 bks. from high school, \$45,000. Kay, x32251 or 331-3379.

Sale: Friendswood/Sun Meadow Estates, wooded lot in established neighborhood, cul-de-sac, bordered by stream & golf course on 2 sides, approx. 245' deep & up to 86' wide, approx. 1/3 acre, util. on site, \$31,500. Doug, x32860 or 486-7412.

Sale: Madisonville, TX., 18,763 unimproved acres, timber, mostly hardwoods, good road, elec., telephone, water avail., ex. squirrel and deer hunting, \$950/acre. Roland, 480-3377 or 538-1697.

### Cars & Trucks

'81 VW Rabbit, 4 dr. sedan, LS model, A/C, AM/FM cass., 4 spd., diesel, \$950. x36213

or 488-7137.

'76 Buick Regal, 2 dr., 350 V-8, A/C, AM/FM cass., clean, reliable, new water pump, battery and tires, \$750. Mary Lou, x34306 or 480-2206.

'79 Olds. Cutlass, AM/FM cass., low mi., new tires, good cond., \$2,000, OBO. 280-9822.

'81 Buick LeSabre, loaded, new sticker/tags, new tires/brakes, new paint, needs trans. work. BO. 331-1136.

'80 Pontiac Bonneville, good work car, 4 door, V-6, \$1,500. x36156 or 331-3709.

'67 Mustang Classic, 289, V-8, 3 spd., new red paint, A/C, AM/FM stereo, mags, headers, new dual exhaust, \$2,995, OBO. Mike, x38169 or 482-8496.

'80 Mazda RX7, black, AM/FM cass., A/C, 5 spd., new brakes, new seats, clean, 95K mi., \$2,500, OBO. 282-4582.

'79 Pontiac Bonneville, 4 dr. sedan, AM/FM, A/C, good tires, 67K mi., good cond., \$2,100. 474-3517.

'86 Bronco II, A/C, AM/FM ST tape, auto., 4x4, transferable extended warranty. David, x33402 or 996-8011.

'84 Pontiac Trans Am, dark blue, loaded, T-tops, V-8 engine, new Dunlop tires, ex. cond., \$6,000. Tina Hay, 280-1505, Cameron or Tina Hay, 331-5815.

'87 Toyota 4x4, Brahma Topper, 27K mi., all maintenance records, \$9,300. 538-1515.

'87 Chevy S-10 Tahoe P/U, V-6, like new, A/C, AM/FM cass., A/T, gauges, full carpet, fabric seats, tilt steering, cruise control, tool box, heavy duty bumper w/hitch, bed liner, \$7,200. Guess, 649-5092.

'87 Audi 5000S, 4 dr., fully loaded w/leather seats, ex. cond., low mi., see to appreciate, \$19,200, OBO. 956-1092.

'84 Ford LTD, auto., P/S, P/B, P/W, P/L, AM/FM cass., cruise control, 4 dr., blue, very good cond., \$3,500. Charles, x32133 or 487-2202.

'84 Dodge Ramcharger, low mi., most extras, showroom, one owner, \$7,000. x33525 or 333-2395.

'85 35' Mallard motor home, loaded, low mi., \$36,000. EXP 34051.

'85 Ford EXP hatchback, 59K mi., auto. trans., A/C, 30 mpg. Steve, x34176 or 486-8424.

'82 Buick Regal Limited, one owner, V-6, P/W and locks, wire wheel covers, \$2,650. B. Cobb, x33531 or 333-3309.

'87 Scamper pop-up camper, model 240C, ex. cond., sleeps 6, opens up to 23' 10", queen and double bed plus sofa and table area, ice box, 3 burner butane stove, \$3,125. 280-9073.

'64 Chevy 1/2 ton P.U., free when you purchase cab-over camper for \$400, truck could use some work, but camper is in very good cond. Mike, x38457, 8-9 am; 3-4:30 pm or 332-5218.

### Cycles

'87 Harley Davidson motorcycle, FXRP, good

JSC

# Dates & Data

## Today

**Combined Federal Campaign—**The JSC Combined Federal Campaign will run through Nov. 18. This year's goal is \$265,000. Campaign representatives will be calling on JSC employees during the campaign. Anyone who does not know who their representative is may call Teresa Sullivan, JSC campaign coordinator, at x38970. Retirees may call Sullivan at 483-8970.

**EAA badges—**Dependents and spouses may apply for a photo identification badge from 6:30-10 p.m., Monday through Friday at the Rec Center.

**Aerobics and exercise—**Both classes are ongoing, and employees may sign up for them at the Rec Center. For more information, call x30303.

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

## Monday

**Cafeteria menu—**Entrees: chicken noodle soup; weiner and beans, round steak with hash browns, meatballs and spaghetti (special). Vegetables: okra tomatoes, carrots, whipped potatoes.

## Tuesday

**Cafeteria menu—**Entrees: beef and barley soup; beef stew, shrimp creole, fried chicken (special), sweet and sour pork chop with fried rice. Vegetables: stewed tomatoes, mixed vegetables, broccoli.

## Wednesday

**Open season—**The Office of Personnel Management (OPM) will hold open season for the Federal Employees Health Benefits Program Nov. 14-Dec. 9. Also, the Human Resources Office will sponsor a one-

day Health Fair from 9 a.m.-2 p.m. Nov. 16 in the ballroom of the Rec Center. For more information, call x32681.

**Astronomy seminar—**Drs. A. Jackson and L. Friesen will present an astronomy seminar focusing on a report from a recent DPS meeting, noon-1 p.m. Nov. 16 in Bldg. 31, Rm. 193.

**Introduction to bridge—**A basic introduction to bridge for those who have never played is given from 5:15-7 p.m. every Wednesday at the Rec Center. Cost is \$10. For more information, call x30303.

**Cafeteria menu—**Entrees: seafood gumbo, fried perch, New England dinner, Swiss steak (special). Vegetables: Italian green beans, cabbage, carrots.

## Thursday

**AIAA lunch and learn—**The AIAA Houston Section Space Systems Technical Committee will host a lunch and learn session at the Bldg. 3 cafeteria from 11:30 a.m.-12:30 p.m. The speaker will be Andre Sylvester of NASA, and the topic will be "Orbital Maneuvering Vehicle Simulation in the Systems Engineering Simulator." For more information, call Michael Laible, 282-4573.

**Artificial intelligence satellites—**The IEEE will host a fourth annual symposium on "Artificial Intelligence and the Knowledge Worker Productivity Challenge: The Payoff and the Potential." The conference will be from 7:30 a.m.-noon Nov. 10 at the Rec Center. For registration information, call Dr. Zafar Taqvi, 333-6544, or Eddie Robinson, 333-7029.

**NCMA luncheon meeting—**The Space City Houston Chapter of the National Contract Management Association (NCMA) luncheon meeting will begin 11:30, Nov. 17 at the Rec Center. Oran Nicks, director of the Space Research Center at Texas A&M University will be the keynote

speaker and will discuss "Observations on the Federal Acquisition Process." For more information, call Mitzi Broyles, x38524.

**Weight safety—**The next weight safety course required for employees wishing to use the Rec Center weight room will be from 8-9:30 p.m. Cost is \$4.

**Cafeteria menu—**Entrees: cream of chicken soup; turkey and dressing, enchiladas w/chili, weiners and baked beans, stuffed bell pepper (special). Vegetables: zucchini squash, English peas, rice.

## Nov. 18

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

## Nov. 19

**Defensive driving—**Defensive driving class will be taught from 8 a.m.-5 p.m. Nov. 19 at the Rec Center. Cost is \$20.

## Nov. 22

**BAPCO meets—**The next meeting of the Bay Area PC Organization (BAPCO) will begin at 7:30 p.m. Nov. 22 at the League City Bank and Trust. For more information, call Earl Rubenstein, x34807, or Ron Waldbillig, 337-5074.

## Dec. 1

**Stress and aging parents seminar—**The Employee Assistance Program will present a seminar on "Stress and Aging Parents" from 11:30 a.m.-12:30 p.m. Dec. 1 in the Bldg. 30 auditorium. Dr. Howard Eisner, a gerontologist from the University of Houston-Clear Lake, will discuss intergenerational relationships, things to expect from aging parents and the available options for providing care for parents. For more information, call the EAP at x36130.

# Swap Shop

cond., low mi. \$5,200. 649-2465.

'80 Honda CB 750F, silver, good Dunlops, S.S. super trapp, K&N air filter, ultra reliable, \$1,000. Bruce, x34925 or 923-4571.

### Boats & Planes

Shakespeare, Trolling motor, 3 spd., \$59. 280-8796.

'9 fiberglass bass boat, 2 swivel seats, Sears 3hp motor, 14' trailer, boat, motor and trailer, \$875. Joe, x33190 or 482-3069.

### Audiovisual & Computers

Atari 800, program recorder, basic and games cartridges, \$450. Tom, 333-2985.

AMIGAWORLD magazine, vols. 1 & 2, first eight issues. David, x36647 or 526-3045.

'64K CoCo 2 with 5 1/4" drive, joy sticks, 300-9600 Baud parallel interface, manuals, books, games, with assembly language package and more, \$150, OBO. x37267.

### Household

Heavy solid oak dining room table and 4 chairs, \$100; square Mediterranean accent table, \$30. 488-2597.

GE portable 5" color TV, with stereo AM/FM removable cass., like new-in box, \$175. 280-8796.

Dinette set w/6 chairs and 48" round table, \$120; matching buffet, \$55; round end table, \$35; RCA AM/FM radio/turntable console, \$55, ideal for weekend retreat home/cabin. 488-1326.

'7 sofa, beige, good quality and cond., can deliver, \$175. Matt, 282-5230 or 280-5076.

Two LR chairs, \$45 ea.; two end tables, \$25 ea.; matching Bassett dresser, \$60; nite stand, \$30; 90" sofa, \$70; all ex. cond. Ben, 482-8998.

Sale or trade, set of 4 antique Victorian dining chairs, \$65; mirror in antique oak frame, \$35. 331-9441.

Mirrors, gold-veined, 45" x 91 1/2", two each, like new, \$200/for two or \$125/each, OBO. Doug, x32860 or 486-7412.

Dinette table w/leaf and four Captain's chairs w/rollers, \$400, OBO. Bob, x31941 or 488-8672.

Living room/coffee table and corner lamp table, black w/braze trim, beveled smoke mirror tops, \$125 for both. 488-5564.

GE small TV w/remote control, almost new; larger TV w/remote control, VCR w/remote control, hardly used. 333-1353.

Full size box springs, headboard, frame, \$20. 486-7831.

Electric range and hood, avocado color, \$45. B. Cobb, x33531 or 333-3309.

Glass table w/4 chairs, \$150. Kay, x32251 or 331-3379.

Kenwood stereo and cassette, \$400. x36156 or 331-3709.

### Wanted

Want enclosed storage for one or two autos, JSC vicinity. x33525 or 333-2395.

Want to buy 1977 or 1978 Oldsmobile 98 Regency or Buick Park Avenue w/403 engine, must have had only one owner and must be extra clean. Ray, x31375 or 534-4839.

Want to buy nursery set in good cond. David, x33402 or 996-8011.

Need roommate for 3-2-2 in Meadowbend, League City, great home, \$200 and util./mo. John, x31929 or 332-0315.

Want to assume 2-2 condo in Clear Lake. 666-8119.

Want to buy electric trains. Don, x37832 or 996-1425.

Want gas clothes dryer, good working cond., any color. (409) 762-1799.

Want mouse and assorted circuit card for an Apple IIe microcomputer. Frank, x30882.

### Photographic

B&J Solar 4x5 enlarger, \$100; Magnalux 35mm enlarger, \$20; Gra-Lab 300 darkroom timer, \$20. Terry White, 332-5177.

Minolta VHS video system: Autofocus camera w/character generator, 5-head portable VCR, TV tuner, carrying cases, \$700. Scott, x37294 or 332-2488.

### Pets & Livestock

Dickinson, horse pasture and/or stalls for rent, pasture, \$30/mo.; partial board, \$45/mo.; full board, \$75/mo., 15 acres, trails. James, 534-2806.

Free to good home, male dog, 60 lbs., neutered, 4 yrs. old., calm disposition, cute, housebroken and good w/children, mostly house dog, John, 280-2133 or 996-7422.

Beautiful AKC Sheltie puppy, female, champ. bloodlines, ex. w/children. 532-1728.

### Musical Instruments

Sale or trade, prof. bass guitar amp., Cerwin/Vega BG 250, 250 watt head w/2 large speaker cabinet, 1-18" speaker and 1-12" speaker in folded horn enclosure, \$450 or trade for 4-track, etc. Mike, 559-2450.

### Lost & Found

Found man's ring in parking lot, south of building 2, describe and it's yours. Ed Lattier, x31452.

### Miscellaneous

Assortment of beautiful rings: diamonds (baguettes and solitaire), lapis, emerald, and two gold only. 333-1353.

Wedding gown, veil, slip, size 5, silk chiffon and lace accented w/seed pearls, have pictures, \$300. x31876.

10" Skil bandsaw/sander, variable speed w/ blades and sanding belts, stand, like new, \$90. Kevin, x30867 or 484-1158.

Two head composite pro mid-plus tennis racquets w/nylon strings, \$75/each or both for \$140. Kyle, x38653.

Nagel's, Patrick, commemorative prints, #7, #11, #12, #13, #14, #15, \$150 to \$500. Mike, x32439 or 326-3947.

Triple dresser, dk. wood, matching large mirror, carved out designs on drawers/doors, \$150; ladies' 10 emerald/3 diamond ring, sz. 5, \$200, OBO; stoneware service for 8, ecru color, \$35. Jana, x31653 or 532-3008.

Huey drafting table, Mod. 2011B, adjust. metal base and tilting drawing surface, K&E horizontal/vertical drafting arm, table size, 38" x 60", \$325. Emery, x39419 or 353-9449.

Tennis racket, never used, Pro Kennex Copper Ace 90, midsize graphite style, was \$70, now, \$50. Cathy, x38607.

Frequency counter 0-600 MHz auto-readout, \$95; Textronic 312 scope, \$80. Pat, x33858 or 332-1262.

Powerbilt Citation persimmon woods, 1, 3 and 5 w/Aldila graphite firm shafts, \$150. Kevin, 4-12 p.m. x38210.

Sleeveless parka (ski vest), sharp, men's medium, never worn, \$20. Bob, 488-0397.

Large tire, like new, 32 x 11.50 R15 LT, Wild Country radial RVT, raised letters, \$25. Ray, x31375 or 534-4839.

Strike bag, \$10; 3 piece fireplace set, \$5; rigid pipe wrenches. Joe, x33190 or 482-3069.

4 BBS alloy rims, 4 bolt w/4.25 inch belt circle; 2-6x13 w/20x6.0 Goodyear Racing Eagle tires and 2-9x13 w/21.5x8.5 tires. Merrill, x34925.

Exer. bike, \$45; 2 child's girl's bikes, \$10 and \$20; circular saw, hardly used, \$25. 486-7831.

Sears men's 10 spd. bike in good cond., was \$120, now \$50, OBO. x37267.

RCA 13" color TV w/remote, ex. cond., \$175; Sony 80 watt stereo amp, \$100; Olympus OM-25 35mm SLR camera, \$150; BSR 5-band graphic equalizer, \$20. Joe, x33559 or 996-1667.

Radio Shack digital multimeter, new in box, \$30; Heathkit frequency counter, \$70; Clarion/Audia TRX100 car stereo w/equalizer, \$100. Joe, x33559 or 996-1667.

Tire, new, never used, Uniroyal Tiger Paw Plus, P165/80R13 M+S, steel belted radial blackwall, \$45, OBO. Sue, x34008.

TV satellite system, 12" Proclon dish mount, Drake receiver and stereo processor, all cables, \$1,500, OBO. 538-3434.

Aquarium and all accessories, \$25. Tony, x35966.

4 S/S Crager rims w/chrome valve stems, chrome locks on all four, less than 1 yr. old, 13" rims, was \$355, now \$275, like new. Brenda, x37747.

Vending machine, 5 selection cold canned drink machine, good cond., \$300. Frank, x32813 or 332-7383.

# BATTLE of the BODY

## Exercise Countermeasure Project strains to maintain space station crew's health



(Continued from Page 1)

in good physical condition to perform their work.

Harris is confident that the right amount of the right exercise can do the job—keep astronauts nearly as fit as they were when they left Earth. "We'd like to maintain their preflight level of fitness, and it could be possible that some people could actually improve," he said. "But, in reality, we'll probably just maintain their fitness, and we may see some loss, but not a significant one."

But how much exercise is required to meet these goals? What muscles need to be exercised? And how can you do that? Those are the questions the team has to answer.

Those answers don't come easily, especially for people involved in current studies relating to the Exercise Countermeasure Project. Four different JSC laboratories are working on the project: the Exercise Development Lab, the Exercise Physiology Lab, the Artificial Intelligence Lab and the Anthropometry and Biomechanical Lab. Each lab is now involved with various studies of test subjects.

In a study under way by the exercise development and exercise physiology labs, four subjects were confined to bed for 17 weeks at Hermann and Methodist Hospitals. Strict bed rest can simulate the effects of prolonged weightlessness, Harris said.

The subjects are now going through a six-week reconditioning period, working out one hour a day on a strict exercise prescription. The study, headed by JSC's Dr. Victor Schneider, will determine if the exercise can bring the subjects back up to their previous level of fitness.

"The theme is to see if we can do what we need to do with just one hour of exercise a day," Harris explained. "Can exercise be effectively done in that short period of time? Can we maintain muscle in an hour? Can we help the cardiovascular system in an hour?"

A second study under way, overseen by Dr. Mike Greenisen of the biomechanical lab, is researching the fine points of running on a treadmill in zero gravity. Six people have been running on a treadmill in normal gravity with electrodes attached to their leg muscles, an attempt to determine the exact movements of muscles during the exercise.

Next, the six will run on a treadmill aboard NASA's KC-135 aircraft as it flies a parabolic path that simulates weightlessness for about 30 seconds during each arch. The runners will be filmed as well as have their leg muscle movements recorded electronically in a "locomotion study." The results will help in designing the restraint system needed for a space treadmill, determining how much simulated weight must be put on the body as it runs in zero-G to get the same results as a normal terrestrial workout, Harris said.

A third study has 10 subjects exercising three times a week on prototypes of equipment that may eventually be part of the Exercise Countermeasure Facility. The equipment includes a stationary bicycle, a treadmill, a rowing machine and a resistive exercise device, essentially a machine that simulates weightlifting.

But these machines are far from the run-of-the-mill versions found in health clubs. They are being trained to think for themselves, to decide for themselves when their users aren't

working hard enough—and, based on that decision, to increase or decrease the workload.

The study is helping project engineer Laurie Webster and software engineer Wanda Pratt from Engineering's Intelligence Systems Branch design what will basically be the brain of The Exercise Countermeasure Facility in the Artificial Intelligence Lab. Exercise prescriptions have been written for the 10 test subjects

by Exercise Physiologist Dr. Steve Siconolfi, himself one of the subjects. Those prescriptions have been fed into the computers that control the exercise devices, and the test subjects work out on their choice of the bike or treadmill three times a week.

Basically, Webster and Pratt are building a computerized fitness instructor. "We're trying to capture the decision-making techniques of the expert," Webster

explained, "We want to design a machine that would behave in a way similar to the way an expert would behave in the same situation."

The artificial intelligence will allow the computer to rewrite the exercise prescription needed to keep a crew member in shape, compensating for the continuing effects of zero-G. "It changes the prescription day to day," Webster said. "If it didn't change it, the person would still just decondition—there would be no compensation for the deconditioning effects of weightlessness on his body."

The exercise machines keep the person's

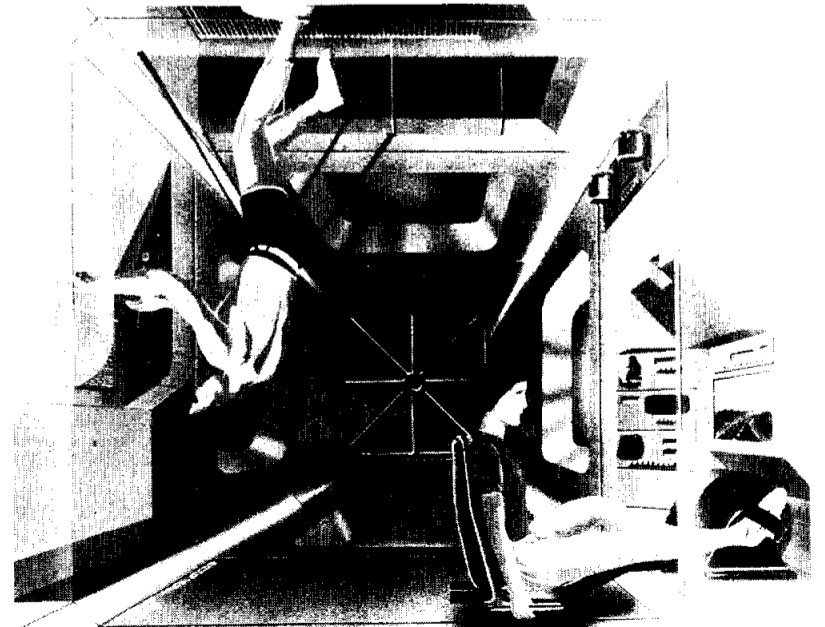
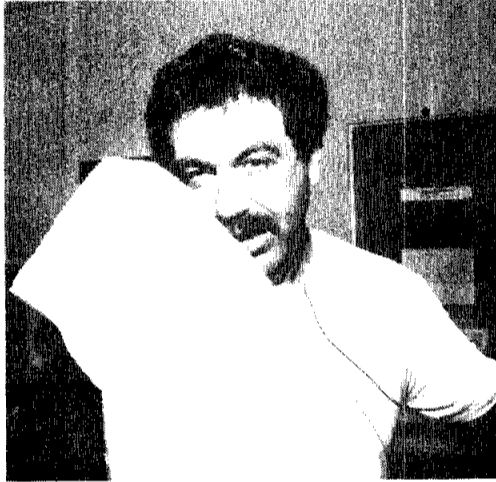
heart rate within a specified target zone. For instance, if the heart rate is too low, the bike will automatically make it more difficult to push the pedals. The treadmill can speed up and create a 5-degree slope to make the runner work harder.

What will eventually be aboard Space Station Freedom will probably be a product of those devices now being tested, Webster said. A combination bicycle and rowing machine and a combination treadmill and simulated weightlifting device are two possibilities, and the lab may receive such combination prototypes in the near future, he added. And day after day, the devices would track the condition of the crew and adjust the amount of exercise they need accordingly. The facility also would be able to transmit that log of data on each crew member's physical condition to Earth.

The devices may also include a voice synthesizer so they can tell exercisers when to begin working out, when to stop, and other information. Motivational items are already being studied as part of the prototype machines. Subjects in the study group can exercise to either music or video of their choice, including scenes that give the appearance of an actual bike ride or jog down a country road.

"Eventually, we may try a video game as motivation, a game situation," Siconolfi said. "They could play the game as part of their exercise."

Exercise in space is more than just staying in condition to return to Earth's gravity, it is a key to good health over a prolonged period of weightlessness, Harris said. "Exercise can keep the muscles toned and the cardiovascular system in shape," he said. "And we think that by keeping the right muscles toned, we can affect the bones. The astronauts must have some way up there of maintaining their physical condition, and, in turn, their health."



Top: Judy Hayes, one of the workers on a study that kept four people confined to a bed for 17 weeks to simulate prolonged weightlessness, watches a computer gauge her exercise on an elongated recumbent bike. Center: Steve Siconolfi takes a breather after working out on the treadmill. Left: Weldon White, a Krug International employee, works out three times a week on a prototype stationary bicycle in Bldg. 37. Above: An artist's conception shows what the Exercise Countermeasure Facility may look like aboard Space Station Freedom.

# Veteran astronaut Bobko to retire from NASA

## Plans to begin private sector work on space station program support

Col. Karol J. "Bo" Bobko, the only astronaut to fly on the maiden voyages of two Space Shuttles, plans to retire from NASA and the U.S. Air Force on January 1, 1989.

His career includes three Space Shuttle missions, one of which was *Challenger's* maiden voyage, and another that was the first flight of *Atlantis*.

Bobko said the primary reason he's leaving is because his Air Force career is coming to a close after 29 years and 6 months. "I've looked at all the options and decided that at this point in my life I should probably try

for a second career."

Bobko will be joining the Space Systems Division of Booz, Allen & Hamilton Inc. He will be directing their activities in the Houston/JSC area with initial emphasis on space station program support. Bobko's last day at JSC will be November 30.

"Their focus is going to be on space operations, so I think I have something to bring to the firm and not leave the NASA community and JSC," he said.

In April 1983, Bobko served as pilot on Shuttle mission STS-6, the first flight of *Challenger*, during which the

first Tracking and Data Relay Satellite was deployed and the first spacewalk of the Shuttle era was achieved.

"I'd dreamed about going into space ever since my middle years at the Air Force academy," Bobko said. "That seed was planted by officers who were developing the early ICBMs. They were looking forward to the days when men would fly in space. It took a while before I got to fly in space, but it finally happened."

In April 1985, Bobko served as commander of his second mission, STS 51-D, which featured the deployment of two communications

satellites and a dramatic attempt to revisit and activate one of those satellites, which had malfunctioned.

He also commanded STS 51-J, the first flight of the Space Shuttle *Atlantis* and the second Department of Defense mission, in October of 1985.

Bobko, an astronaut since 1970, was a member of the Skylab Medical Experiments Altitude Test (SMEAT) in 1972. He also served on astronaut support crews for the Apollo-Soyuz Test Project in 1975 and for the Space Shuttle Approach and Landing Tests conducted at Edwards Air Force Base in California.



Karol "Bo" Bobko



Program Support Office staffers check out the new plaque that will be awarded to NASA employees with 30 years or more service. From left are Nancy Bond, Duane Ross and Maria Szekeley.

## Awards job is rewarding

By Beverly Green

If there were an award for the folks who make sure employees receive the awards they've been nominated for, the JSC Program Support Office staff probably would be one of the first recipients.

While innovation demonstrated through creative work may be the quality that enables employees to distinguish themselves among peers, it is the three-person awards processing crew that helps ensure accolades don't get lost in a bureaucratic shuffle. It is through their careful attention and the long-standing system of honors that employees receive tangible proof they've performed above the call of duty.

"The awards program serves as a springboard to continue encouraging high levels of performance and to motivate employees to achieve high levels of performance. For what we spend, it is an excellent investment," said Duane Ross, chief of the Program Support Office.

"When I receive an award it gives me a sense of accomplishment and achievement. It gets me pumped up to continue trying to do good things and makes me feel good all over," he said.

Ross has been a member of the JSC community for more than two

decades, and he's been responsible for overseeing timely and accurate awards presentations for nearly three years.

Ross's formal training has been in the fields of sociology and psychology and at JSC he uses this background to develop and maintain a "keen sensitivity" for the awards processing procedure.

"Awards make people happy. This is one of the ways that people are rewarded for good work and it's always a fulfilling thing to assist in the process," he said.

Management of the awards process is a task Ross doesn't take lightly and fine tuning nominees' paperwork is a responsibility the awards crew handles with care.

"We do a lot of proofreading to verify employees' names for the proper identification of awards nominees," said Nancy Bond, incentive awards clerk. "Accurate spellings of names are carefully verified through our database because these awards are precious and many employees enjoy sharing them with family members," she said.

"During this time of year we may receive paper work for several hundred nominees and process about 1,000 nominations in one week," he said. "Once we receive

the paperwork from a particular division we try to verify the information the same day and get it over to payroll by the next day," Ross said.

"It's our number one priority and we try to get those awards out first thing," he said.

The payroll division actually sends the recommendations to the U.S. Treasury in Austin and a check is cut within 10 or 15 working days.

"Every special award doesn't automatically warrant a cash award," said Ross. "However, other detailed information is equally as important to us and anxious employees," he said.

There are five basic award categories: Performance Management Recognition System (PMRS) Awards, Special Achievement Awards, Suggestion Awards, Space Act Awards and Length of Service Awards.

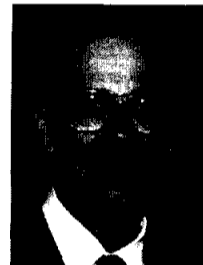
"Recently, we've developed a handsome plaque that provides a special honor to veteran employees," said Bond, an incentive awards clerk who assisted in the selection of the newest item, which will be awarded to employees with 30 years or more federal service. "We hope to provide plaques at the next awards ceremony planned for mid summer," she said.

## Unisys employee receives original Partnership Award

Gordon H. Stauble, a group manager for the Unisys Management and Training Software Department, has become the first person to receive the JSC Quality Partnership Award.

JSC Director Aaron Cohen presented the award to Stauble on Nov. 2 following JSC Quality Week. The award, established by the Safety, Reliability and Quality Assurance Office, is designed to recognize a professional who does not work in the quality field for contributions to quality at the center.

Stauble is in charge of management systems efforts for the Space Transportation Systems Operations Contract (STSOC). He was nominated by co-workers Russell Graham, supervisor of Unisys Mission Operations Directorate (MOD) Information Systems, and Anthony Bukowski, a senior systems analyst for Unisys under the Rockwell Shuttle Operations



Stauble

Contractor (RSOC).

"Mr. Stauble has always maintained a high quality standard for our work on the STSOC and MOD management systems we develop and support," their nomination reads. "He continually strives to instill that same high standard of quality within all of his employees. This has been demonstrated by a quality poster program begun by Mr. Stauble in 1986, support of Productivity Action Teams (PATs), a productivity and quality matrix for tracking purposes, his volunteering of time as a member of our corrective action review board, and best of all his initiative in volunteering to serve as a Unisys quality education seminar instructor."

The quality education seminars began this year, and include 20 hours of training for every Unisys employee. Stauble's classes have been well attended and praised for including lectures from top quality experts.

"He is an enthusiastic advocate of quality programs," said Conley Perry, deputy chief of JSC's Quality Assurance and Engineering Division. "He has a zeal for promoting quality for Unisys."

## 23 JSC workers receive awards

JSC Director Aaron Cohen presented Suggestion and Space Act Awards to 23 JSC civil service employees Friday during a ceremony in Bldg. 1.

Irwin D. Smith, an employee at the White Sands Test Facility, received the top monetary award of \$5,000 for a suggestion regarding hypergolic propellants.

Winston T. Goodrich, deputy chief of the Advanced Programs Office's Aerospace Branch, received a \$2,500 Suggestion Award for his suggestion on the crew escape pole.

Other Suggestion Award winners were Anibal J. da Silva, who received awards for suggestions on optical display alignment and digital gamma compensation devices, and Jesse T. Adkins Jr., Chalmer V. Holloway, Glory Allahverani, William S. Lee and William R. Whipkey, all of who were recognized for cost savings on procurement suggestions. David H. Bruch and Rodney J. Etchberger were honored for their suggestion on materials cost estimating and fee negotiation for science payload development engineering and operations.

Patent Applications Awards were presented to Frederic S. Dawn and Joseph J. Kosmo Jr., for a tapered, tubular polyester fabric; Richard J. Bozeman Jr. for a real time amplitude, frequency and time domain analyzer; John A. Schliesing, John P. McManamen and Gregory A. Lange, for a Space Shuttle Orbiter-to-space station docking system; Steven L. Koontz for an atmospheric pressure flow reactor for studying gas phase reaction kinetics; Leo G. Monford Jr., for docking alignment; Dennis R. Morrison for a perfusion bioreactor for cell culture in microgravity; and David A. Wolf for a bioreactor cell culture vessel and a rotating cell culture device.

Astronaut Franklin Chang-Diaz received a Scientific or Technical Contribution Award for his infusion extractor device, and Olin L. Graham received the same award for a range and range rate system.

NASA Tech Briefs Awards went to Richard J. Bozeman, Jr. for his real time amplitude, frequency and time domain analyzer, and to Richard T. Walter, for an electrochemical environmental gas supply system.

## CFC nears goal, needs donations

JSC is nearing its goal in the 1988 Combined Federal Campaign (CFC) with a total of \$236,293.20 contributed as of Wednesday, but employees are urged to continue giving during the final week of the CFC and meet or beat a \$265,000 total.

The drive will continue through Friday, said Teresa Sullivan, JSC's coordinator for the campaign. With each of the three reporting dates so far in the campaign the contributions have been gradually tapering off, but officials are urging those who haven't given to do so soon. So far, 2,413 employees have donated.

"Keep the money coming, folks," Sullivan urged. "We're hoping for a surge in contributions near the end that will put us over the top. We want

you to give from your heart; it's not often you have a chance to do so much for so many with so little."

Sullivan said the goal is to have all 3,307 civil servants and military personnel at JSC participate. "With higher participation, we can easily reach the goal," she said.

The CFC is a once-a-year voluntary fund-raising effort that gives workers a chance to contribute to local, national and international health and welfare charities. The total goal for the United Way drive of Houston this year is \$50 million, and the Houston-area CFC hopes to raise at least \$2 million of that goal. Last year, the CFC raised about \$1.3 million, a fifth of which was given by JSC employees.

## 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.

Editor..... Kelly Humphries  
Asst. Editor... James Hartsfield  
Staff Writer..... Beverly Green

## Roundup won't be published on day after Thanksgiving

The Space News Roundup will not be published Nov. 25 because of the Thanksgiving holiday, nor on Dec. 30, the Friday between the Christmas and New Year's Day holidays.

Notice of any news stories and events upcoming between Nov. 18 and Dec. 2 should be delivered to the Roundup office, Bldg. 2, Rm. 147, by 5 p.m. Monday.

Swap Shop classified ads re-

ceived by today will appear in the Dec. 2 issue.

Notice of news and events that will occur between Dec. 24 and Jan. 6, 1989, should be delivered to the Roundup office by 5 p.m. Dec. 14.

The deadline for Swap Shop ads to appear in the Dec. 23 issue is 5 p.m. Dec. 9. Ads received after that deadline will be printed in the Jan. 6 issue of the Roundup.