



Practice makes perfect

The STS-61 crew is busy training for their five space walks on the Hubble servicing mission. Photos on Page 3.



Final farewell

Friends and co-workers of Aaron Cohen bid the former JSC director goodbye with a special banner. Photo on Page 4.

Space News Roundup

Vol. 32

August 30, 1993

No. 33

Team unable to make contact with Mars Observer

By Kari Fluegel

Flight controllers for the Mars Observer are continuing with "increased vigor" to reestablish communications with the satellite in hopes of determining the fate of the errant probe.

Last week controllers at NASA's Jet Propulsion Laboratory waited anxiously for a timer in the spacecraft's computers to expire hoping the Observer's automatic systems would then reestablish contact on its own. However, shortly before 5 p.m. Central Wednesday when the command loss timer ran out, no signal was received.

"Unfortunately, we still have no two-way communication or one-way communication or data of any kind from the spacecraft," said Glenn Cunningham, project manager of the Mars Observer.

Since the critical timing sequence has passed, the control team can begin being more aggressive in trying to troubleshoot the problem with hardware and procedure changes and other activities with the spacecraft, Cunningham said.

"We're still working really hard," he said. "We have not given up."

Late last week, controllers were trying to reconfigure the hardware

in the telecommunications and reboot the spacecraft's central computers.

Cunningham also said that controllers have continued to send commands to the spacecraft over the past few days in hope that the Observer would enter Mars orbit. It is possible that those commands may have reset the command loss timer at the five-day mark. If they are not successful in their other troubleshooting procedures, controllers eventually may have to refrain from sending commands completely for five days to see if the timer triggers.

Still, "Every day without communications clearly lessens our probability of success," Cunningham said.

The troubles for the spacecraft started Aug. 21 when communications were lost while the tanks in the propulsion system were being pressurized. The system would have been used to slow the Observer so that it could enter Mars orbit.

There has been some outside speculation that the fuel tanks could have been over pressurized resulting in an explosion and subsequent break up of the spacecraft. But program manager William Panter said

there was less than a 1-in-1,000 chance it exploded.

The tanks have backup pressure regulators, and the pressure shouldn't have been strong enough to rupture the tanks, Panter said.

The Mars Observer was launched from the Kennedy Space Center Sept. 25 on a 450-million-mile journey to the Red Planet. It was designed to spend two years studying Mars' geology, weather and climate. Mars Observer also was to be the first U.S. exploration of Mars since the twin Viking orbiters and their landers reached the Red Planet 17 years ago.

Contact lost with NOAA spacecraft

Satellite controllers have lost contact with the NOAA-13 satellite, and preliminary indications are that the spacecraft's power system is not working, officials at NASA and the National Oceanic and Atmospheric Administration announced last week.

All battery charging aboard the satellite ceased at approximately 2:45 p.m. Central Aug. 21, said Charles E. Thienel, meteorological satellites project manager at the Goddard Space Flight Center. Contact with the spacecraft during subsequent ground passes showed steadily decreasing battery voltages and currents, he said.

Output from the solar arrays continued to be normal, Thienel said, indicating a failure in the circuitry between the solar arrays and the batteries. There has been no contact with the spacecraft since approximately 6:15 p.m. Central Aug. 21.

The spacecraft was launched by the U.S. Air Force from Vandenberg Air Force Base, Calif., on Aug. 9. Spacecraft operations were turned over to NOAA on Aug. 12 as a part of planned checkout procedures. Instrument checkouts were continuing at the time of the failure.

NOAA-13 is the newest in a series of polar-orbiting weather satellites. It is designed to monitor the Earth's ocean and atmosphere. It collects meteorological and ocean data for direct transmission to users around the world and to central data processing centers.

NOAA-11, which NOAA-13 was planned to replace, was launched in September 1988 and NOAA-12 in May 1991. Both are providing environmental data to users around the world. NOAA officials said the problem with NOAA-13 would not affect weather coverage.

NASA and NOAA will convene a review board to investigate the incident.



JSC Photo by Benny Benavides

Sen. Phil Gramm, R-Texas, right, discusses JSC's status as the space station program host center with Space and Life Sciences Director Carolyn Huntoon. Touring the space station mockup in Bldg. 9 with them were Protocol Chief Elena Salsitz, Host Center Transition Team leader John O'Neill, Acting JSC Director Paul J. Weitz, and Acting Engineering Director Leonard Nicholson.

Gramm gives support to space station effort

By Kelly Humphries

Texas Sen. Phil Gramm told JSC managers and employees during a recent visit that although he was initially skeptical about the space station redesign effort, he now is fully behind President Clinton's budget request for NASA and the new station.

Gramm, who was here for a series of briefings by top JSC managers, congratulated JSC on being designated the host center for the redesign space station.

"I think it's a great testament to the work

you do, to the quality of that work, to the value that you give to the American taxpayer," Gramm said. "That victory was obviously important to Houston, it was important to Texas, but I also believe it was important to America because I'm confident that we can and will do this job better than anybody else would have done it."

Gramm, who is ranking Republican on the Senate appropriations committee that

Please see **GRAMM**, Page 4.

Discovery launch set following engine swap

By James Hartsfield

With three new engines installed and undergoing standard testing, shuttle managers Monday set 6:38 a.m. CDT Sept. 10 as *Discovery's* next launch date for STS-51.

"The Sept. 10 date is based on successful testing and leak checks of the main engines scheduled for later this week and the assumption of no significant problems arising in the remaining process flow," Shuttle Director Tom Utsman said. "The entire shuttle team is doing a super job getting *Discovery* back into launch configuration."

Discovery will carry the Advanced Communications Technology Satellite, or ACTS, and its Transfer Orbit Stage booster into orbit as well as the Orbiting and Retrievable Far and Extreme Ultraviolet Spectrometer, or ORFEUS, telescope mounted on a Shuttle Pallet Satellite. Last week, technicians at KSC worked on leak checks of the main engines and main propulsion system plumbing and installed the engine dome heat shields. During the weekend, a flight readiness test, a checkout of the electrical and mechanical components of the engine parts, was planned.

In addition, the spacesuits aboard *Discovery* were double-checked, batteries in the solid rockets were replaced and the hydraulic system was checked. With the Sept. 10 launch date, the countdown clock for STS-51 would begin ticking late on Labor Day.

Elsewhere, *Columbia* is now being prepared for a launch in the first week of October on STS-58, the Spacelab Life Sciences-2 mission. *Columbia* is now in Bay 2 of the Vehicle Assembly Bldg., attached to its fuel tank and solid rockets for STS-58.

Plans are to roll *Columbia* to the launch pad four to five days after the launch of *Discovery*. This week, technicians cleaned the crew cabin; tested the connections between *Columbia*, the fuel tank and the solid rockets; and performed leak checks of the main propulsion system.

Elsewhere, *Endeavour* will be the next shuttle to fly following *Columbia's* launch on STS-58. With the delay in *Discovery's* launch on STS-51, *Discovery's* following mission, STS-60 carrying the Wake Shield Facility, will not be launched until January 1994. *Endeavour* remains on schedule for a launch on STS-61, the mission to service the Hubble Space Telescope, in early December.

Endeavour is in the Bay 1 shuttle processing

Please see **LAUNCH**, Page 4.



Cabana to command STS-65 next year

By Barbara Schwartz

Marine Col. Robert D. Cabana will command the STS-65 mission scheduled for the summer of 1994 aboard *Columbia*.

The STS-65 pilot will be Air Force Maj. James D. Halsell Jr. Also named to the flight as a mission specialist this past Monday was Air Force Maj. Carl E. Walz.

Previously assigned crew members are Payload Commander Rick Hieb and Mission Specialists Leroy Chiao and Don Thomas, and Japanese Payload Specialist Chiaki Mukai.

The STS-65 mission will fly the International Microgravity Laboratory, which has a complement of international experiments focusing on materials and life sciences research in microgravity.

The payload crew members will perform the experiments during a 13-day mission while the orbiter is flown in a "gravity gradient" stabilized attitude, with its tail toward Earth, to maintain the best possible laboratory conditions with the least gravitational disturbances in the Spacelab.

Cabana, 44, was pilot on STS-41 in October 1990, a mission to deploy

the *Ulysses* spacecraft for its four-year journey to study Jupiter, and on STS-53 in December 1992, a Department of Defense mission.

This is the first shuttle mission for Halsell, 36, who was born in Monroe, Louisiana, and received a master of science degree in space operations from the Air Force Institute of Technology in 1985.

Walz, 37, is a mission specialist on STS-51 set for next month, which will deploy the U.S. Advanced Communications Technology Satellite and deploy and retrieve the Shuttle Pallet Satellite, during a nine-day mission.



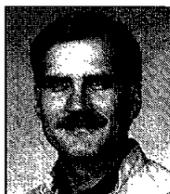
Cabana



Halsell



Walz



Hieb

Spacelab mission management goes to life sciences

JSC's Flight Projects Office, which manages Spacelab life sciences missions and secondary payloads, has been transferred to the Space and Life Sciences Directorate from the New Initiatives Office.

The office will retain its existing structure, but has been renamed the Science Payloads Management Office, Code SM. Curtis LeBlanc will continue to manage the office,

Please see **SCIENCE**, Page 4.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Astros vs. San Diego Padres (1:35 p.m., Sept. 19, Astrodome) — Discount tickets: \$9; on sale until Sept. 3.

Moody Gardens — Discount tickets to three of five attractions: \$14.

Six Flags Over Texas — Discount tickets: one-day pass, \$19.95; two-day pass, \$24.95 and children under four feet, \$18.95.

Splash Town USA — Discount tickets: \$10.50.

Astrworld — Discount tickets: adult, \$18.95; children under 4 1/2 feet, \$15.95.

Waterworld — Discount tickets: \$9.95.

Sea World in San Antonio — Discount tickets: adult, \$19.75; child (3-11), \$13.15.

Fiesta Texas, San Antonio — Discount tickets: adult, \$18.35; child (6-11) \$12.75.

Space Center Houston — Discount tickets: adult, \$7.50; child (3-11) \$4.50; commemorative: \$9.95.

Metro tickets — Passes, books and single tickets available.

Movie discounts — General Cinema, \$4.50; AMC Theater, \$3.75; Loew's Theater, \$4.

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 two 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-Friday. Dependents must be between 16 and 23 years old.

Defensive driving — Course is offered from 8 a.m.-4:30 p.m. Sept. 18. Cost is \$19.

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

Aerobics — High/low-impact class meets 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. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido — Martial arts class meets from 5-7:30 p.m. Tuesdays. Cost is \$15 per month.

Country and western dance — Beginner class meets from 7-8:30 p.m., and intermediate class from 8:30-10 p.m. Mondays beginning Sept. 27. Cost is \$20 per couple.

Softball tournament — Men's open "C" double elimination tournament will be Sept. 25-26. Registration deadline is 7 p.m. Sept. 23; cost is \$95.

Fitness program — Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Weir at x30301.

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: Bayou Vista, 2 lots, #132 and #133, \$5k/ea. Joe, 282-3155 or 409-945-2190.

Sale: Dickinson, 3-2, pool, spa, completely remodeled, FPL, wetbar, brick decking, cov patio, owner finance 50%, \$75k. 282-2965 or 337-4664.

Lease: Sagelen, 4-2-2, formal living/dining, den, breakfast area, FPL, ceiling fan, refrig, no pets, \$900/mo. 282-3229 or 286-4547.

Sale: Pebblebrook condo, 2-2, FPL, refrig, stove, W/D, \$29.5k. 334-2379.

Sale: El Dorado Trace condo, 1-1.5-2, all appl, patio, balcony, designer carpet/wallpaper, low equity assum. Jerene, 488-1900 or 764-0185.

Sale: LC/Meadowbend, 4-2-2, FPL, ceiling fans, newly landscaped, \$74.9k negotiable, assum. Peter, 526-1853.

Sale: West of Downtown, townhome, 3-2.5-2, pool, alarm, 2 FPL, wetbar, wood floor in DR, \$90k. x30866 or 863-1005.

Sale: Mount Olivet Cemetery, 4 grave spaces, section 139D, \$800. 409-687-2587.

Sale: Seabrook, 3-2-2, formal LR, new AC, yard w/big trees, \$61k. 474-9132.

Lease: Oakbrook, 4-2.5-2, formals, many upgrades, \$1140/mo. 333-6338 or 480-9436.

Sale: Angelton, 2 wooded acre lots on corner, stocked fishing lakes, amenities, \$22k negotiable. 489-7286.

Sale: CLC, 3-2-2, new carpet, vinyl, paint, indoor spa. 486-7380.

Sale: Meadowbend, 4-2-2, lg living rm, FPL, cathedral ceiling, \$67,775, current rates, \$668. 947-3166.

Sale: LaMarque, 4 lots, no restrictions, 71 1/2 ft x 138 ft. 409-935-8426.

Rent: Cancun, 2 BR condo, daily maid service, kitchen, sleeps 8, \$500/wk. Katie, x33185.

Sale: Forest Bend, 3-2-2, new roof, paint, child's playhouse, lg backyard, upgrades, \$72k negotiable. Ted, x36894 or 992-4814.

Sale/Lease: Camino South, 3-2-2, sec sys, fans, cul-de-sac, FPL. x36463 or 554-6104.

Sale: LC, waterfront Marina TH, 2-2, \$99.5k. Steve Brody, 703-487-7138 or 703-532-3415.

Cars & Trucks

'87 Pontiac Firebird, 2.8 V6, t-tops, PS/PW/PL, tilt, red, good cond, \$3695. 326-4825 or 326-1415.

'85 Mustang, 3 spd, 170, low miles, working, \$2.5k OBO. x46184 or 438-8755.

'80 Ford Pinto, 2 DR hatch, 4 spd, AC needs service, new brakes, front/rear, rebuilt fuel pump, water pump, master cyl, for parts/restoration, \$400 OBO. Rudy, x33836 or 946-7028.

'84 Nissan Stanza, 4 dr sedan, 5 spd, new AC, new clutch, AM/FM/cass, 126k mi, \$2.4k. Kelly, 480-6944.

'88 Pontiac Grand AM LE, blk, 2 dr, 2.3quad 4, 5 spd, sunroof, AM/FM/cass, elec w/l/s, 79k mi,

\$3.7k. Dan, x30764 or 334-5270.

'83 Ford Supercab PU, long wheel base w/delux camper shell, loaded, ex cond, 95k mi, \$3k.; '87 Chev Cavalier, blue, 52k mi, ex cond, \$3.3k. 482-0888.

'84 Ford Mustang GT, V8, auto, rebuilt trans, \$3.7k. 332-6477 or 244-5122.

'78 Porsche 928, brwn w/leather int, auto, ex cond, 75k mi, \$8.5k. Bill, x48889.

'72 Datsun 240Z, 2500k mi on rebuilt engine, \$3.5k. Larry, x33946 or 480-0803.

'67 Ford PU, V8, little rust, good work truck, \$900 OBO. 484-7104.

'91 Nissan Stanza XE, auto, air, pwr windows/locks, tilt, cruise, AM/FM/cass, 57k mi, \$9.5k. James, x40045 or 332-1129.

'88 T-Bird turbo coupe, 33k mi, red, loaded, sec sys, 11 mo ESP warr left, \$10k. x30705 or 280-9149.

'89 Mustang LX 5.0, slightly wrecked, loaded, \$1.5k + take over pymts. Lisa, x48178 or 478-4807.

'83 Mazda 626, AM/FM/cass, AC, all elec, 4 dr hatch, sunroof, \$1.5k OBO. 996-8821.

'81 VW Rabbit diesel, rebuilt eng, new tires/shocks, 4 dr, AC, no dents/rust, \$2295. 280-9621.

'79 Ford F150 PU, 351 eng, rebuilt trans, new brakes, ugly, \$500. Paul, x48095 or 996-8326.

'89 Probe GT, red, 5 spd, 4 cyl, pwr locks, AM/FM/cass, cruise, tilt, custom wheels, new tires, AC, 39k mi, \$8250. 334-4423.

'85 Pontiac Parisienne, cruise, loaded, one owner, good cond, \$2.1k. Bob, x30223 or 481-6486.

'84 Ford Club Wagon XLT, 106k mi, seats reupholstered, new carpet, \$4.8k. 554-6242.

'80 Honda Accord, loaded, \$950. 867-8820.

'86 Honda Accord LX, 56k mi, loaded, ex cond, \$5.1k. Siders, x38033 or 538-1734.

'84 BMW 325i, wht, 5 spd, tint windows, ex cond, \$4.5k negotiable. Norbert, 680-4189 or 721-8654.

'81 Celica, new radials, paint, clutch plate, AC, interior clean, runs great, \$1.4k. 471-6837.

'79 Mustang, 5.0 V8, AC, alloy wheels, silver, 160k mi, needs paint, \$2k OBO. Dave, x38118 or 280-9541.

Boats & Planes

Surfboard, natural arts thruster, \$225. Bill or David, 554-6242.

'18' Prindle w/trlr, new sails, dbl trapeze, ex cond, \$1.8k OBO; 22'4 Gulf Coast sailboat, fixed keel, main, jib, spinnaker, new uphol, 6HS Johnson, new bottom job, hull paint, \$2.5k OBO. Greg, x35560 or 474-7634.

'17' sailboat w/trlr, 1 main sail, 2 head sails, spinnaker, good cond, \$900. 332-3991.

HO Magnum waterski, 72", adj boot, good cond, w/HO case, \$150 OBO. x38929 or 332-2915.

Chaparral 187, 140 hp Mercruiser I/O, modified deep v hull, ss prop, ex cond, \$5.7k. x37954 or 481-1605.

'79 Evinrude 70 hp O/B, PT&T, \$800. Tom, x38123 or 474-5042.

Robalo cc 21', '89 Johnson 175, t-top, VHF, loran, df, ex cond, \$14,950. Mark, x36193 or 480-8918.

'88 MacGregor, swing keel, 2 sails, VHF, 4 hp O/B, \$6.9k; Honda O/B, 8 hp, 2 cyl w/auto oil

JSC

Dates & Data

Today

Blood pressure screening — The American Heart Association is sponsoring a blood pressure screening from 8:30-11:30 a.m. in Bldg. 1, 1-2 p.m. in Bldg. 7A and 2:30-3:30 p.m. in Bldg. 32 Aug. 30. Daily screening will be available from 10 a.m.-12 noon and 2-4 p.m. in Bldg. 8. For more information, call Dolores Bellfore at x34111.

Cafeteria menu — Special: meat sauce and spaghetti. Entrees: wieners and sauerkraut, sweet and sour pork chop, potato baked chicken, steamed fish, French dip sandwich. Soup: cream of asparagus. Vegetables: French cut green beans, seasoned rice, California vegetables, buttered beans.

Tuesday

Blood drive — The next JSC on-site blood drive will be from 8-11:30 a.m. and 1-3:30 p.m. Aug. 31 at the Gilruth Center. For more information, contact Susan Anderson at x33073.

Blood pressure screening — The American Heart Association is sponsoring a blood pressure screening from 8:30 a.m.-12 noon in Bldg. 30, 1-2:30 p.m. in Bldg. 16 and 3-4 p.m. in Bldg. 31 Aug. 31. For more information, call Dolores Bellfore at x34111.

Cafeteria menu — Special: smothered steak with dressing. Entrees: beef stew, liver and onions, shrimp Creole, baked chicken, French dip sandwich. Soup: navy bean. Vegetables: steamed rice, seasoned cabbage, corn O'Brien, peas, potatoes au gratin.

Wednesday

Blood pressure screening — The American Heart Association is sponsoring a blood pressure screening from 8:30-11:30 a.m. in Bldg. 45, 1-2 p.m. in Bldg. 44 and 2:30-4 p.m. in Bldg. 325 Sept. 1. For more information, contact Dolores Bellfore at x34111.

Cafeteria menu — Special: salmon croquette. Entrees: roast pork, baked perch, steamed fish, vegetable lasagna, Reuben sandwich. Soup: seafood gumbo. Vegetables: mustard greens, okra and tomatoes, vegetable sticks, lima beans.

Thursday

Blood pressure screening — The American Heart Association is sponsoring a blood pressure screening from 8:30-10 a.m. in Bldg. 419, 10:30-11:30 a.m. in Bldg. 273, 1-2 p.m. in Bldg. 15 and 2:30-4 p.m. in Bldg. 4S Sept. 2. For more information, call Dolores Bellfore at x34111.

Cafeteria menu — Special: stuffed cabbage rolls. Entrees: beef tacos, ham and lima beans, pork and beef egg rolls, steamed fish, French dip sandwich. Soup: beef and barley. Vegetables: Brussels sprouts, green beans, buttered squash, pinto beans.

Friday

Cafeteria menu — Special: baked chicken. Entrees: deviled crab, Creole baked cod, baked chicken, beef cannelloni, Reuben sandwich. Soup: seafood gumbo. Vegetables: seasoned carrots, peas, breaded okra, steamed cauliflower.

Monday

Labor Day — Most JSC offices will be closed in observance of the Labor Day Holiday.

Sept. 7

Blood drive — Lockheed will host a blood drive from 8-11:30 a.m. and 1-3:30 p.m. Sept. 7 at Lockheed Plaza 4. For more information, call Gayle Brown at 333-6514.

Sept. 8

Freedom Fighters meet — The Space Station Freedom Fighters will meet at noon and 5 p.m. Sept. 8 at the McDonnell Douglas Bldg. at Space Center and Bay Area Blvd. For more information, contact David Cochran at 482-7005.

Blood drive — Lockheed will host blood drives from 8-11:30 a.m. and 1-3:30 p.m. Sept. 8 at Lockheed Plaza 3 and from 1:30-4 p.m. Sept. 8 at Lockheed Plaza 5. For more information, call Joan Wade at 282-65009.

Sept. 9

Blood drive — Lockheed will host a blood drive from 8 a.m.-11:30 a.m. and 1-3:30 p.m. Sept. 9 at Lockheed Plaza 1. For more information, call Gayle Brown at 333-6514.

Oct. 31

Bike tour — The Lions Eye Bank of Texas and the JSC Bike Club are sponsoring the 15th Annual Texas Coastal Cruise. The ride will begin at 8 a.m. Oct. 31 at Clear Lake Park on NASA Road 1. For more information, call 798-5510.

injection, remote tank, 30 hrs, \$700. Paul, x48095 or 996-8326.

21' Boston Whaler w/'79 200 hp Evinrude, trlr, ex cond, \$8.5k. 334-4423.

Skeeter S-80 bass boat, 70hp Johnson, tilt, trim, drive-on trlr, extras, \$4k. Johnson, 488-5010.

2 surfboards, \$25/ea. Greg, x37318 or 335-8102.

16' Hobie w/trlr, includes Harken blocks, \$1.3k. 992-3227.

Cycles

'85 Honda Goldwing Interstate, 3rd owner, adult ridden, prof maintained, new tires, batt, fresh tuneup, oil/filter change, inspection sticker, \$4k. Gene, x36424 or 482-0139.

Audiovisual & Computers

AM/FM stereo, digital tuning, station mem, came from Plymouth Laser, \$40 OBO. Ted, x36894 or 992-4814.

Tandy GX1000 computer, 8088, \$100. Greg, x37318 or 335-8102.

PCXT turbo, 10 MH spd, 640 RAM, 20 MB HD, 2 FD, graphics card, \$199. Lucky, x36198.

PCXT clone, mono monitor w/Hercules graphics, 20 MB HD, 5.25 FD, modem, Okidata 92 printer, DOS 3.3, \$295. Charlie, 488-4412.

Packard Bell 286, 5.25 & 3.5 MB FD, color monitor, VGA/EGA video card, needs new hard drive, \$600. John, x47179 or 486-7760.

Toshiba laptop, 1000SE, 3.5 MB FD, 1MB mem incl up to 384k RAM, \$450. x37319.

Microsoft Fortran, \$100; Turbo C++ Prof 2.0, \$75; 2400 baud/4800 w/compression modem for IBM PC, \$50. Robert, x47960.

Pets & Livestock

AKC black lab, 1 yr old, housebroken, comes w/extra large pet porter, \$250 OBO. 488-7982.

Small barn, 12x12 w/runs, pasture, cov was rack, dressage arena, jumps, full core, \$185. Maureen or Kate, 409-925-2149.

Musical Instruments

B.C. Rich guitar w/case/stand, Crate 40c amp, NADY 201 handheld wireless mic, digital delay, ultima mic stand, \$1.5k. Kate, 471-3119.

Guild Model D40C acoustic/elec guitar w/hardcase, spruce top, scalloped bracing, multiple binding, was \$1.6k, now \$595, layaway. 280-9621.

Trombone w/case, ex cond, \$250. x38804.

Upright vertical grand piano, \$400 OBO. Donna, x30261 or 334-5082.

Baldwin Acrosonic spinet piano/bench, \$500 OBO. Laura, x30886 or 863-1005.

Household

Wood grain formica dinette, 6 chairs, \$100; easy chair, \$85; painted bookcase, \$30; coffee tbl, \$20; 1.3 cu ft microwave, \$40. 326-4150.

Zenith console tv w/remote, herculon sofa, maple dropleaf coffee tbl, lg paintings, other items., 480-3839.

Microwave, ex cond, \$85. 331-9907.

Exec desk, refinished walnut, matching computer storage unit, \$995. Dale, x48179 or 481-0046.

Sm rattan loveseat, \$100; 19" color tv, needs work, best offer. Anita. x33341 or 559-1761.

Full sz bed, incl matt, box springs, frame, oak

hdbd, ex cond, \$100; blue 2 pc sectional sofa, 15 yrs old, \$30 OBO. x33600 or 996-8826.

4 pc canister set, \$10; brass coat tree, \$15; brass lamp, \$25. 472-7526.

GE solid wood entertainment center, \$150; Kenmore mini refrig, \$89; dining tbl w/leaf, \$39; tool chest, 3 drws, \$35. 482-8921.

Glass top dining tbl, 4 chairs, \$100. Ruby, x33669 or 334-7537.

Dining rm tbl, \$30; barometer, \$12.50; folding lounge chair, \$7.50; pocket knife, \$20; elec stove, \$12.50; tv or microwave tbl, 2 shelves, \$15; Bentwood captains chair, \$25. 488-5564.

2 mirrors, 3" by 8"; 1 mirror, 3" by 4"; 2 beveled mirror strips, 4" by 8"; all mounting hardware, \$135 OBO; 3' sq glass tbl top w/beveled edges, \$60 OBO. Rob, x38061 or 486-1804.

LR set, lg couch, loveseat, lg/sm bentwood rockers, heavy wood coffee tbl, end tbl, \$300, will sell separately. Viola or Larry, x31794 or 481-9058.

Sq kitchen tbl, 4 chairs, wood tbl w/padded chairs, earth tones, \$100 OBO. 474-3438.

Dining rm tbl, brass/wood frame, glass top, 4 chairs, \$70. Paul, x48095 or 996-8326.

Canister vacuum, \$20; collegiate type reclining chair, earhorne, \$25. Mary Jo, 554-2233.

2 bar stools, brass/cane backs, \$30/ea; GE microwave, 10 yrs old, \$50; extra wide child barrier, expands to 8', \$20. x37479 or 538-3434.

Complete full bedroom suite, good cond, \$250. Lorie, x31703 or 334-6543.

Wanted

Want 2 or 3 person tent for backpacking or cycling trips, 2 sleeping bags, rated to 20°F, must be compact/lightweight. x33031.

Want to buy Mac computer. 867-8820.

Want responsible nonsmoker to rent furn rm in Friendswood, util paid, \$240/mo. x47049 or 480-3424.

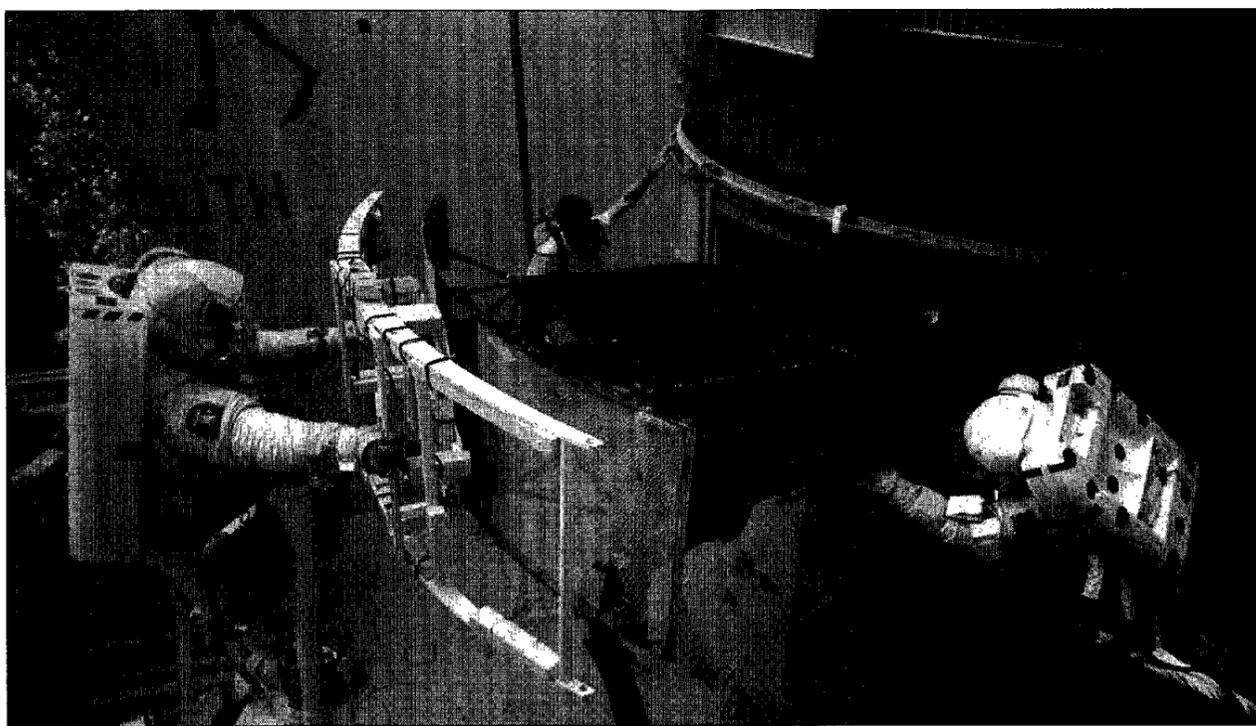
Want to buy boys 20" 5 or 6 spd all terrain bike in good cond. 480-5130.

Want roommate to share apt in LaPorte, \$163/mo + 1/2 util. John, 536-5784.

Want roommate to share house in Kemah, lg yard, \$400/mo +

Practice, Practice, Practice

STS-61 space walkers learning to use tools of Hubble servicing trade



As the Hubble Space Telescope servicing mission nears, the STS-61 crew is on schedule about halfway through its training regimen for the five-space walk flight.

Flight hardware that will fly aboard *Endeavour* for use by the crew is arriving at Kennedy Space Center. The Wide-Field/Planetary Camera II is in Hangar AE, a NASA Spacecraft Checkout Facility on Cape Canaveral Air Force Station, and during the next two weeks another 17 trucks will be transferring other servicing and support hardware from Goddard Space Flight Center in Greenbelt, Md., to KSC. The instruments have been in a clean room at Goddard for the past several months undergoing integration and testing.

Other primary components that will be arriving include the Corrective Optics Space Telescope Axial Replacement, two solar panels, the Goddard High Resolution Spectrograph repair kit, rate sensors and electronic control units and two magnetometers.

Endeavour and its crew of seven — Commander Dick Covey, Pilot Ken Bowersox, Payload Commander Story Musgrave, and Mission Specialists Tom Akers, Jeff Hoffman, Claude Nicollier and Kathy Thornton — are scheduled to lift off in early December.

From top to bottom, left to right:

- 1) In JSC's Weightless Environment Training Facility, Musgrave and Hoffman remove a full-scale training mock-up of the WF/PC from the underwater HST mock-up. The old WF/PC will be replaced with the new WF/PC-2.
- 2) Swiss astronaut Nicollier maneuvers an inflatable astronaut mockup using the manipulator development facility in JSC's Bldg. 9. During the mission, Nicollier will be called upon to carefully position the space walkers for their work on the telescope.

- 3) Akers, bottom, and Thornton practice using tools that will be required to accomplish the HST servicing work as WETF divers support their training. These tools are for the solar array changeout.

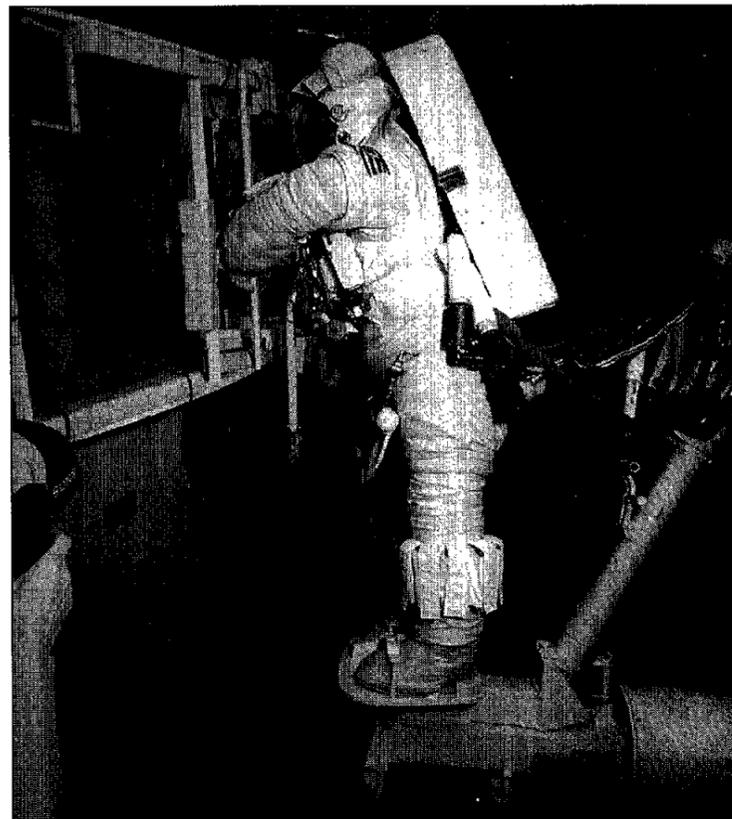
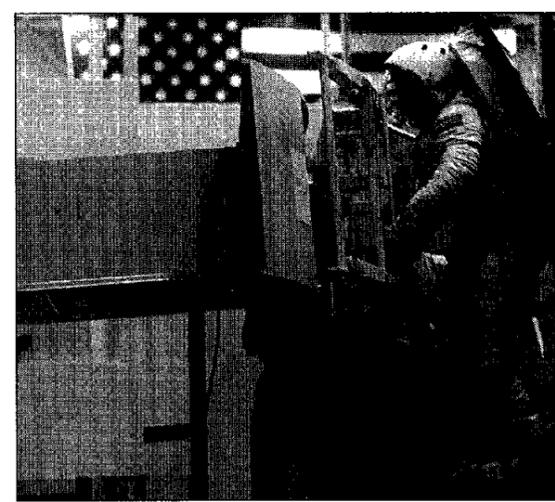
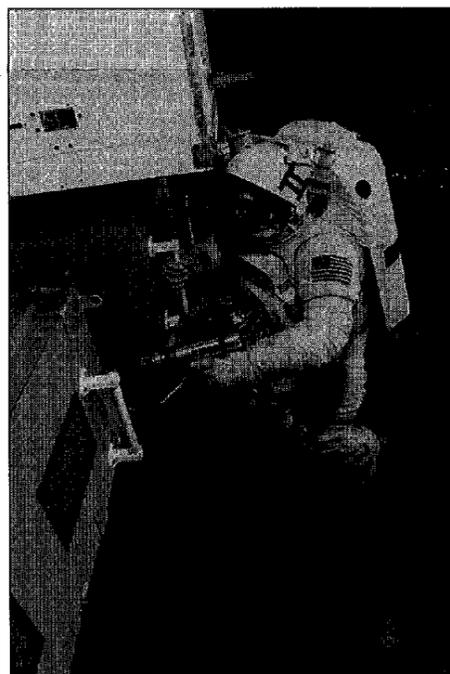
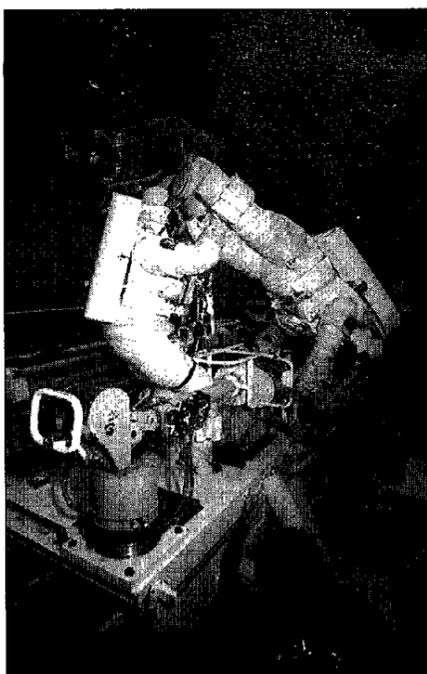
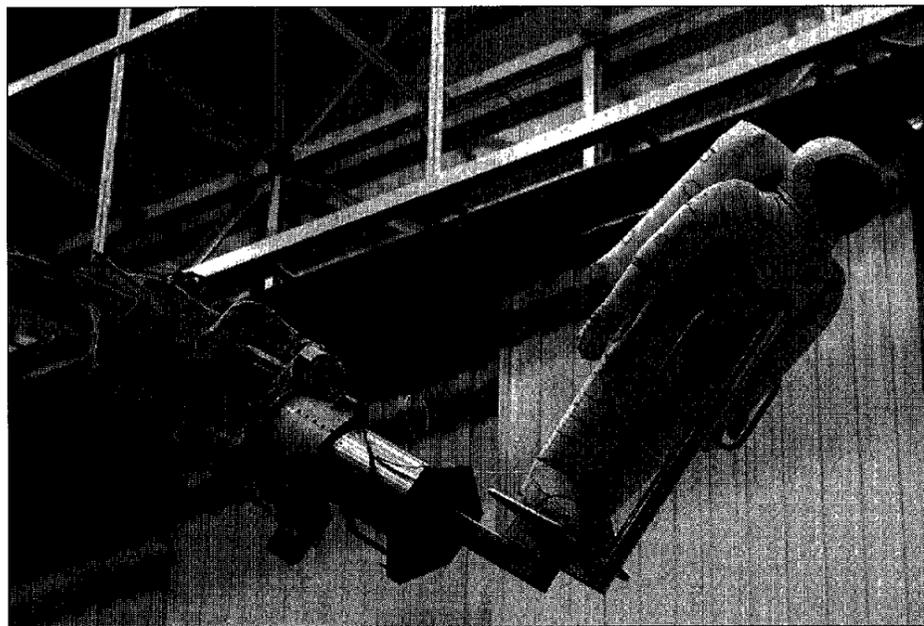
- 4) Akers, left, and Thornton work with a full-scale mockup of the solar array carrier in the WETF. HST's solar arrays will be replaced as part of the servicing mission.

- 5) In Marshall Space Flight Center's Neutral Buoyancy Simulator, Hoffman uses a power wrench to open a stowage facility during a training session.

- 6) Hoffman practices working with the WF/PC on the air-bearing floor in JSC's shuttle mockup and integration laboratory.

- 7) Thornton, right foreground, and Akers, right background, are prepared for an underwater rehearsal session in the MSFC Neutral Buoyancy Simulator.

- 8) Standing in a mobile foot restraint connected to the WETF's underwater robot arm, Thornton grasps a large support structure that attaches to the WF/PC. □



NASA Photos

Scientists conclude Pluto covered with nitrogen ice

The distant planet Pluto is covered with surface ices that are 98 percent nitrogen, NASA and other scientists say. With such abundant nitrogen surface ice, Pluto's thin atmosphere must be primarily gaseous nitrogen, they conclude.

This is the first clear detection of nitrogen on Pluto and the first clear indication that the atmosphere is mostly nitrogen gas rather than methane, as previously believed. Carbon monoxide also was detected for the first time.

"Rather than methane as previously thought, it appears that frozen nitro-

gen dominates the surface," said Dr. Ted Roush. Roush, employed by San Francisco State University, works at Ames Research Center.

Methane was detected on Pluto's surface in 1976. Extremely small amounts of methane are easy to detect because it strongly absorbs specific wavelengths of sunlight.

"The small amounts (1.5 percent) of methane ice are 'dissolved,' or mixed at a molecular level, in the frozen nitrogen," Roush said.

The abundant nitrogen recently found on Pluto is a poor absorber of sunlight and produces very weak fea-

tures in the light reflected from the planet, so it previously had not been identified.

The observations were made in Hawaii with a new instrument on the United Kingdom Infrared Telescope in May 1992. The results are published in the current issue of *Science* magazine, along with similar observations of Neptune's moon, Triton.

Pluto resembles Triton in size and in surface and atmospheric composition. Both have nitrogen, methane and carbon monoxide ices on their surface.

Because their surfaces are made of

similar materials, scientists think Pluto and Triton may have formed in a similar location in the solar nebula, Roush said.

Pluto, almost 3 billion miles from Earth, is the only planet not yet explored by a spacecraft. Pluto is unusual in several respects. Although classified as a planet, it is smaller than Earth's moon. Pluto's only moon, Charon, is at least half as big as the planet itself. It also is the only planet in the solar system with an orbit highly inclined out of the plane of the solar system.

The authors, with Roush, include

first author Dr. Tobias Owen, University of Hawaii; Dr. Dale Cruikshank of Ames; and Drs. J. L. Elliot and L. A. Young, Massachusetts Institute of Technology. Young is the daughter of STS-58 Alternate Payload Specialist Larry Young.

Additional authors are C. de Bergh, Observatoire de Paris-Meudon, France; B. Schmitt, St. Martin d'Heres, France; T. R. Geballe, Joint Astronomy Center, Hilo, Hawaii; R. H. Brown, Jet Propulsion Laboratory, Pasadena; and M. J. Bartholomew, Ames.

Local students win black history poster contest

Two local students are the winners of a Black History Poster Contest sponsored by JSC's Black Employment Program Council.

Gilbert Salazar of Clear Brook High School and Demetrius Ferguson of Dickinson High School were honored at a recent BEPC meeting, and their posters are to be flown on an upcoming shuttle mission.

The poster contest was part of the council's Black History Program in February, which followed the theme "Afro-American Scholars, Leaders, Activists and Writers."

The BEPC is accepting applications for membership. Interested employees should contact council members Tamyra Martin, Crystal Mullen, Mark Falls, C.L. Ross, Renee Julian, Preston Lewis, Phashetha Allen, Baley Davis, Katherine Coleman, Lebarian Stokes, Johnnie Lee or Norfleet Williams, or the Equal Opportunity Programs Office, x30607.

AIAA forms fluid dynamics group

Issues in fluid dynamics research and technology will be the focus of a new technical committee chartered by the American Institute of Aeronautics and Astronautics-Houston Section.

The Fluid Dynamics Technical Committee will disseminate the latest developments in the field among industry, government, educational institutions and research centers.

Speakers are sought for several technical forums planned for the 1993-1994 AIAA session.

Anyone interested in fluid dynamics who would like to assist with committee operations or presentations should contact Dr. Rakesh Bhargava of the Advanced Turbomachinery Engineering and Research Center at 983-9371.

Child Care Center has two openings

The JSC Child Care Center has announced two openings for children in its three-year-old class.

The Child Care Center, nationally accredited by the National Association for the Education of Young Children, is near the Gilruth Center and child care services are available to both civil servant and on-site contractor employees. The openings in the three-year-old class are available now.

For information on placing your child in the center, contact Georgia Strain at x34734. Child care hours are 7 a.m.-5:30 p.m.

Science payload management finds new home

(Continued from Page 1)

reporting directly to Space and Life Sciences Director Carolyn Huntoon.

The office will remain in charge of both Spacelab pressurized module and pallet life sciences missions, managing the resources available to human and non-human life sciences programs, putting together ground team Payload

Operations Control Center support, and integrating support certification and flight safety processes, LeBlanc said.

The office integrates experiment hardware with the Spacelab modules, and helps coordinate training for whole mission, including payload flight crew and ground control teams.

Space and Life Sciences Deputy

Director Don Robbins said the move is expected to generate efficiencies in Spacelab life sciences management and create a simpler, more user-friendly link for scientists working with NASA. The change also will provide better coordination with the Life Sciences Project Division as it works to develop, build, integrate and operate experiment hardware.

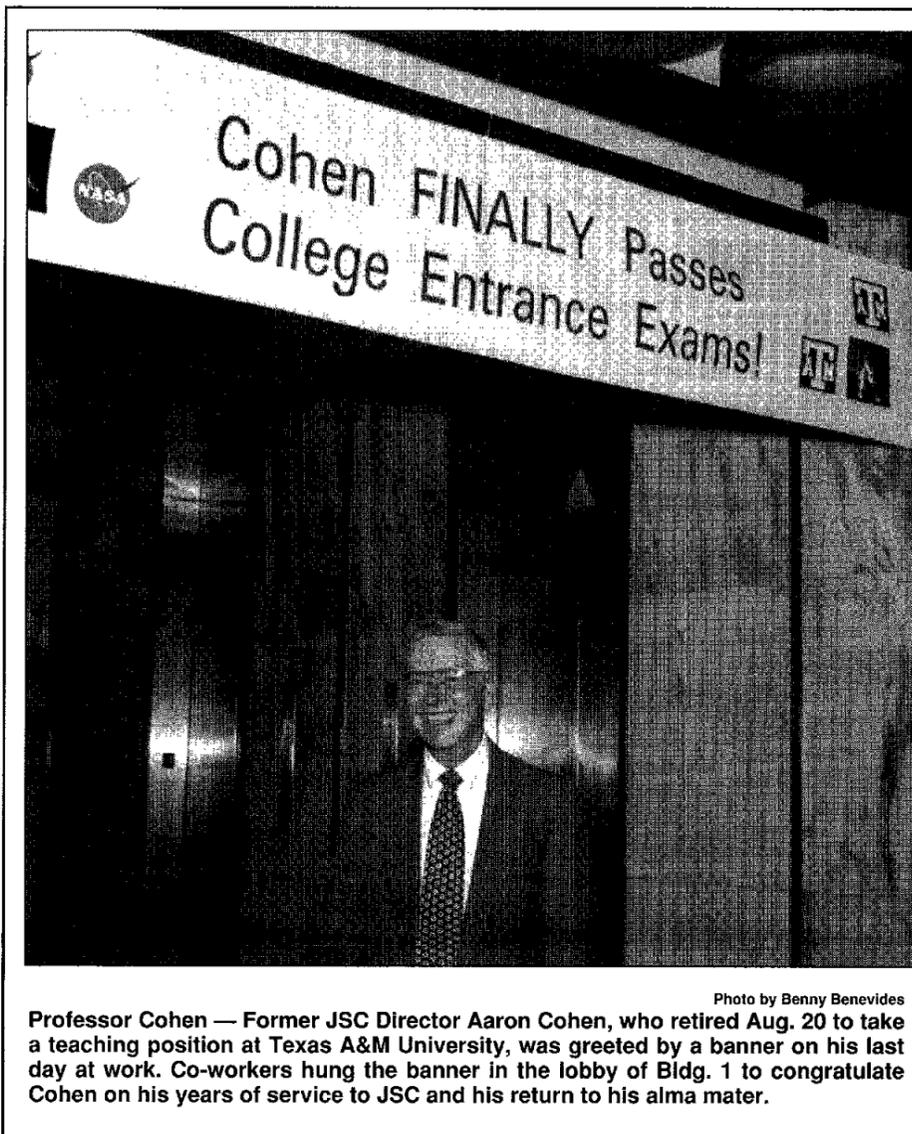


Photo by Benny Benevides

Professor Cohen — Former JSC Director Aaron Cohen, who retired Aug. 20 to take a teaching position at Texas A&M University, was greeted by a banner on his last day at work. Co-workers hung the banner in the lobby of Bldg. 1 to congratulate Cohen on his years of service to JSC and his return to his alma mater.

Security slogan could earn you parking space

That long walk from the parking lot to the office may become shorter for four lucky winners of the Security Division's slogan writing contest.

As part of its activities for Security Awareness Week, October 11-15, the Security Division is inviting NASA employees and contractors to create slogans promoting good security practices.

Four slogans will be selected by the Security Awareness Committee and the winners will be rewarded with a reserved parking space near their office for one month. All slogan submissions are due to Joe Olivarez or Cindy King at JS2 no later than close of business Sept. 24.

In addition to the privilege of a reserved parking space, the winners will see their slogans published in the quarterly Security Newsletter. They also will be displayed as banners during the Security Fair to be held Oct. 13 and 14 in Teague Auditorium.

Four win Gilruth Center prizes

The Gilruth Center's Focus on Physical Activity Day held during the recent introduction to JSC's new Total Health wellness program provided participants with information on nutrition, weight training, and an opportunity to win valuable door prizes.

Local merchants donated the health and fitness-related door prizes. Winners were: Sandra Rybarczyk - \$20 gift certificate from Webster Bicycle; Dan G. Sheely - \$50 gift certificate from the Foot Locker; Jeppie Compton - \$50 gift certificate from the Bike Barn; and Joan Compton - \$35 gift certificate from Discover Scuba.

Everyone attending the event at the Gilruth Center had the opportunity to learn about research done by the JSC health-related fitness staff, and current programs being offered by the recreation staff.

Gramm briefed on space station progress

(Continued from Page 1)

will vote on the fiscal 1994 NASA budget, said he is working closely with committee chair Sen. Barbara Mikulski, D-Md., on a bipartisan effort to pass NASA funding as proposed by the White House. He said they hope to bring the bill to the floor of the Senate quickly, defeat the "standard amendment to kill station" and win the appropriations vote.

"I do not believe America is going to back away from its commitment to the space station," he said.

Gramm also noted that he believes Russian participation in the redesigned station is important and should be that of a major partner, taking advantage of the expertise and experience that the Russians have developed over years of long-duration space flight.

Acting Engineering Director Leonard Nicholson briefed Gramm on the progress of the JSC engineering team during the redesign effort.

He noted that the hybrid Option A that was selected includes a truss structure 58 feet shorter than

that of the previous station design, a combination of common modules and resources nodes, propulsion and attitude control systems based on the Lockheed Bus 1 concept and a new attitude that will allow the solar arrays to collect sufficient power from the Sun without needing alpha joints for pointing.

The new design provides for human-tended capability in just four shuttle flights and an international human-tended capability with 14 construction and outfitting shuttle flights.

JSC will concentrate its engineering work on building the truss, assembly operations, navigation and control, propulsion, human systems, thermal and data management systems, and cost and schedule inputs, Nicholson said. It will work closely with teams from Marshall Space Flight Center and Lewis Research Center.

"We understand that we have a significant challenge in front of us and we are prepared to do whatever is necessary to implement the selected program approach once all the trade studies are finalized,"

Nicholson said.

JSC engineers continue to study how Russian hardware can be used in developing the American space station, he said.

Space and Life Sciences Director Carolyn Huntoon said the scientific community is looking forward to having a long-term microgravity environment in which to conduct biology and materials experiments.

"There is a lot of technology that is just right on the edge now of great discoveries that microgravity is certain to help us with," she said.

With the space station, JSC will be able to redouble its efforts to study how humans adapt to the space flight environment.

"Our main function is to make sure that whatever environment we have for the crew, it will be a safe environment, one that they can be healthy and productive in," Huntoon said.

Host Center Transition Team Leader John O'Neill said JSC will become the home of 300-plus civil service workers in the new streamlined space station program office, and that the center already is

developing plans to accommodate the influx of new people and work.

"We're eager to take on the challenge of providing the support critical to the program's success," O'Neill said. "JSC has always been totally committed to human space flight, so we're ready to provide the resources necessary to make a permanent orbiting laboratory a reality."

The new program office will be responsible for managing the design, development, physical and analytical integration of station as it evolves into operations.

JSC will contribute personnel and facilities to those efforts, and add matrixed support in the areas of systems engineering, systems development, verification and operations.

The new prime contractor, Boeing Defense and Space Group, plans to locate its program manager and staff at JSC, although it has not yet announced how many people that will entail. JSC expects to locate the contractor's offices on-site near the station program offices, he added.

Launch for STS-51 scheduled for Sept. 10

(Continued from Page 1)

hangar at the Kennedy Space Center. Work this week included installation of the drag chute, check-outs of the water spray boilers, installation of a fifth set of hydrogen and oxygen tanks for generating electricity in orbit, tests of the star tracker doors and tests of the 17-inch fuel line door.

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 Monday by the Public Affairs Office for all space center employees.