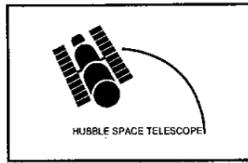


Speedy turnaround

This mockup of a Mir docking port shows where a JSC-built target is now bolted. Story on Page 3.



'Double' find

Hubble Space Telescope images intensify mystery of Andromeda galaxy development. Story on Page 4.

Space News Roundup

Vol. 32

July 26, 1993

No. 29

Switch fixed; same time, same shuttle

By James Hartsfield

Same space shuttle time, same shuttle channel, but it's one week and five minutes later — *Discovery's* crew for mission STS-51 left JSC Wednesday for Florida in anticipation of a second launch attempt in as many weeks, now set for 8:27 a.m. CDT Saturday.

The July 17 launch, which had been scheduled for 8:22 a.m., was postponed with about one hour left in the countdown due to a faulty switch in launch pad equipment. The switch was in one of two sets — a



primary and a backup — of pad electronics that fire explosives at liftoff to break loose bolts that hold the shuttle to the pad. The switch allowed the circuitry in the pad equipment to build up the electric charge that fires the explosives, however there was no danger of the explosives firing prematurely since the shuttle's computers must send two more commands at launch to trigger them, Launch Director Bob Sieck explained.

The crew returned to Houston, and KSC technicians removed the suspect circuit card from pad equipment, called the ground pyrotechnic initiator controller or PIC the next day. The problem was traced to a prematurely charged capacitor, and a new electronics card was installed. Technicians later duplicated the problem with the old circuits in a laboratory. Tests of the repaired PIC at the pad then proved it to be operating normally.

A shortened countdown was expected to begin at the T-minus 11 hours mark late Friday, and the weather was forecast to have a 90 percent chance of being acceptable for the launch.

Once in orbit, the crew — Commander Frank Culbertson, Pilot Bill Readdy and Mission Specialists Jim Newman, Dan Bursch and Carl Walz — was to almost immediately begin work to deploy the first of two satellites — the Advanced Communications Technology Satellite, or ACTS — on the afternoon of launch day. The second, the Shuttle Pallet Satellite, or SPAS, carrying the Orbiting and Retrievable Far and Extreme Ultraviolet Spectrometer, or ORFEUS, was to be deployed the second day of the flight, on Sunday

Please see **EVA**, Page 4



JSC Photo by Jack Jacob
NASA Administrator Daniel S. Goldin, left, greets JSC Director Aaron Cohen at the Spaceweek National Gala at Space Center Houston. Cohen, who announced his retirement earlier in the day, will become the Zachry Professor of Engineering at Texas A&M University and serve as a special consultant to the administrator on human space flight, research and technology.

Goldin: space team must secure levees

Like residents of Midwestern towns inundated by flood waters, the space community must pull together during its current crisis or "we won't have a town to go to after the floodwaters recede," NASA Administrator Daniel Goldin told attendees at the Spaceweek National Gala.

Goldin observed the devastated areas around Quincy, Ill., en route to his July 16 talk at Space Center Houston, and he said the human drama offers important lessons for NASA employees and contractors.

"We have been in our own flood in the space program over the past several months. A flood of uncertainty. A flood of doubt. A flood that has threatened the team approach that has been so important to our community for the last 35 years," he said.

The volunteers working around

the clock on the Mississippi levees in Quincy have filled more than a million sandbags in an effort to save their economic lifeline, while putting their own homes at risk, he noted.

"They aren't gathered around their individual homes trying to sandbag those. They have come together to protect the greater interests of the community. As the floodwaters have come into our own community in recent months, I don't think we can make the same proud claim. Some have pulled away, and their only interest has been to sandbag their own particular interests," Goldin said.

The administrator said the view from Washington is that the space community must come together to accomplish the seemingly impossible or risk losing our economic lifeline in the future.

Leaves JSC in August

Cohen retires, plans to teach at Texas A&M

JSC Director Aaron Cohen will retire from NASA effective Aug. 20 to become the Zachry Professor of Engineering at his alma mater, Texas A&M University, when the fall term opens.

"After being someplace for 30 years, it is with a great sense of accomplishment, but also you have to say with an enormous feeling of nostalgia that I have decided to go to Texas A&M," Cohen said in announcing his decision at a July 16 news conference with NASA Administrator Daniel S. Goldin at JSC.

"I have had the privilege of working with the giants of our profession, and I have had the good fortune to see future giants in the making. I am confident our nation's future space endeavors will be in good hands, and I look forward to helping Texas A&M educate our nation's future engineers," he said.

Deputy Director Paul J. Weitz will become acting director upon Cohen's departure, and Goldin said that a permanent replacement would be appointed only after careful, deliberate consideration.

"One of our most distinguished directors and managers in NASA is going to be leaving the NASA family, sort of," Goldin said. "I know my fellow NASA employees join me in saying we will sorely miss him and his wise counsel and advice. Aaron can take great pride in his past achievements as he now takes on the challenge of an academic career. We all wish him well as he returns to Texas A&M. I know his new career will be one that is equally marked by great accomplishments and dedicated service."

Texas Gov. Ann Richards congratulated Texas A&M on its new faculty addition. "We are so glad to know he will stay in Texas and share his knowledge with future engineers from that institution," she said.

Goldin said that Cohen will serve as a special consultant to the administrator on human space flight, research and technology.

"He has such a knowledge base we at NASA couldn't let go of him. Aaron is just a national resource and

we want to be sure he's still connected with NASA. Texas isn't going to lose you and NASA isn't going to lose you, you now have two jobs to perform," Goldin said. "His continuing involvement will allow us to take advantage of his tremendous experience, knowledge and expertise. Both Texas A&M and NASA can continue to benefit from the involvement of one of NASA's finest managers and engineers."

Cohen's departure will mark the end of a 33-year career with the federal government, including seven years as JSC director and one year as acting deputy administrator of NASA.

He came to NASA in 1962 and served in key leadership roles in the Apollo Program, where his efforts were critical to the successes of all six U.S. lunar landings. He subsequently served as the manager for the space shuttle orbiter, directing its design, development, production and initial flight testing.

Cohen was made responsible for all engineering and research at JSC following the successful completion of the space shuttle orbital flight tests, assuming his present responsibilities as JSC director in 1986. From March 1992 to March 1993, he served as acting deputy administrator of NASA.

He also spent two years of commissioned service with the U.S. Army.

"Aaron represents all of the finest you could hope for in a government servant," Goldin said. "His career and his accomplishments speak for themselves. He provides a benchmark. He has brought technical excellence, integrity, dedication and leadership to the Johnson Space Center and NASA. His career serves as an example to us all, and he leaves behind a lasting legacy."

Cohen's many honors include the highest award for senior federal executives, the Presidential Rank of Distinguished Executive (1982 and 1988) and he has three times been the recipient of NASA's highest award, the Distinguished Service

Please see **COHEN**, Page 4

JSC managers in first SES candidate class

Training program designed to prepare NASA for coming years

Seven JSC managers have been selected to participate in the first class of NASA's new Senior Executive Service Candidate Development Program.

The JSC candidates are among 58 selected throughout the agency in an effort to help NASA prepare for anticipated SES vacancies in the next fiscal year by providing additional developmental opportunities for already highly qualified men and women.

The JSC candidates are: Douglas P. Blanchard, chief of the Solar System Exploration Division in the Space and Life Sciences Directorate; Norman H. Chaffee, deputy chief of Engineering's Automation and Robotics Division; James A. Hickmon,

deputy director of Center Operations; Elena M. Huffstetler, chief of the Information Resources Management Integration Office in the Information Systems Directorate; Humboldt C. Mandell, deputy manager of the New Initiatives Office; Paul Sollock, chief of Engineering's Flight Data Systems Division; and Virginia A. Whitelaw, deputy manager of the Avionics Office in the Space Station Projects Office.

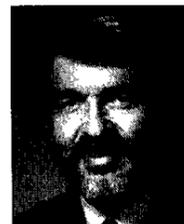
"Judging by the number of highly qualified applicants, NASA is fortunate to have such a highly motivated, bright and talented core of people," said Sam Armstrong, associate administrator for Human Resources and Education.

"Depending on the success of the first class, we look forward to offering the opportunity again next year."

Forty-nine candidates have backgrounds in engineering and technical fields, and nine have experience in administrative fields. Forty-six are from field centers and 12 are from Headquarters. Ten are minority males, and five are minority females.

Each of the candidates will work with a designated SES mentor to prepare an individual development plan designed to strengthen their executive management skills. They will spend at least 120 days in a developmental work assignment, gaining

Please see **SES**, Page 4



Blanchard



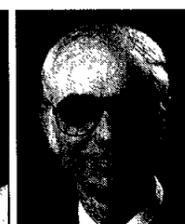
Chaffee



Hickmon



Huffstetler



Mandell



Sollock

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.

- 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.
Astroworld — 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.
Sea World and Fiesta Texas — Discount coupons: \$6 off discount prices if tickets purchased for both parks.
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; Loews 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. Aug. 21. Cost is \$19.

Weight safety — Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. July 27. 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.

Golf — Group lessons are offered from 5:30-6:30 p.m. Mondays for six weeks in August at the Clear Lake Golf Course. Cost is \$90.

Country and western dance — Beginner class meets from 7-8:30 p.m.; intermediate class meets from 8:30-10 p.m. for six weeks beginning Aug. 9. Cost is \$20 per couple.

Ballroom dance — Classes meet Thursdays for eight weeks beginning Aug. 12. Beginner and beginner intermediate meets from 7-8:15 p.m.; intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is \$60.

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.

Fiction workshop — Offered from 6:30-9 p.m. Wednesdays for five weeks beginning Aug. 11. Cost is \$80.

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: Dickinson, 3-2-2, lg living rm, master BR, split floor plan, cathedral ceiling, cov patio, all appl, assumable. 538-1217.
Sale: Forest Bend, 3-2-2, new roof, paint, child's playhouse, lg backyard, upgrades, \$72k negotiable. Ted, x36894 or 992-4814.

Lease: CLC, 3-2-2, fenced, no pets, \$700/mo + 500 dep, avail Aug 1. 326-6782.
Sale: Sterling Knoll, 3-2-2, pool, FPL, extra, \$69.9k, x32264 or 486-9760.

Sale: Dickinson, 4-3-2D, study, game room, gourmet kitch w/ceramic tile, breakfast room, built in China cab, wet bar, FPL, \$123k. Shirley, 335-1607 or 335-0641.

Sale: Dickinson, 4-2.5-2, pool, FPL, wetbar, 100 yr old trees, 3/4 acre, sec sys, \$220k. x34354 or 337-1640.

Sale: Galveston, San Luis condo eff, gulfview, swimup bar, quarter timeshare, \$14.5k. 326-4938.
Rent: Southern Colorado, 2 BR house, furn, sleeps 5, close to skiing, fishing, national forest are, no smoking, no pets, day/wk/mo or longer. Bob, x30825 or 998-7372.

Sale: Lake Livingston, Impala Woods at Onalaska, 30 x 70 lot, camp or build, 1/2 mi off water, util avail, paved roads, \$3k. Teena, x37787 or 422-6369.

Rent: Colorado, condo, furn, sleeps 6, hiking, biking, fishing, horseback, golf, mountains, low summer rates through Oct. 488-4453.

Lease: NW of Uvalde, hunting, 3500 acres, deer, dove, quail, \$780. Bill, x34447 or 479-5129.

Sale: Univ Place TH, 2-2.5, gar, FPL, tenant, \$73k OBO. Dave, x38156 or Herb, x38161.

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

Rent: Nassau Bay, 4-2-2, 1.5 story, recently remodeled, \$950/mo. Minh, x30992 or 484-2456.

Sale/Lease: Kemah/CL Shores, 4-2-2, approx 2000 sq ft, ceiling fans, miniblinds, deck, lg yard w/trees, skylight, formal dining, \$77k or \$750/mo + dep. 334-2335.

Rent: CL/Ellington, 2 BR condo, ceiling fans, fresh paint, nice carpet, \$475/mo + dep. 326-1761.

Sale: Univ Green, 3-2-2, new AC, ceiling fans, deck, custom miniblinds, drapes, all appl, 9.5% no approval assumable loan, ex cond, \$85k. 488-0345.

Cars & Trucks

'92 Ford Ranger PU, metallic green, 5-sp w/OD, 29k mi, tool box, bedliner, stereo cass, AC. 478-5103.

'86 Oldsmobile Cutlass Cierra, loaded, leather, tint, all pwr, 89k mi, \$2.8k OBO. 326-1461.

'71 Chevy Nova, V8, orig owner, \$4.5k. 480-1998.

'83 Pontiac Bonneville, V8, low miles, good tires, no rust, auto trans, pwr steering, pwr brakes, \$1.8k. 282-4014 or 332-2337.

'90 Chevy Beretta, mechanic owned, charcoal gray, ex cond, 56k highway miles, \$6250 OBO. Jennifer, x38668 or 286-0507.

'48 Crosley w/handbuilt body, eng not running, appraisal and pictures avail, \$1.5k. 333-3254.

'88 Ford Tempo GLS, 2 dr, 5 spd, PS/PB, AC, cloth seats, AM/FM/cass, \$3.5k OBO. 332-3911 or 488-9080.

'79 Mercedes, 300SD turbo diesel, new paint, new tires, sunroof, AC, \$5.3k. 455-7322.

'83 Volvo, runs well, needs work, \$1k OBO. Yaremi, x48508 or 286-7911.

'78 Corvette, 25 yr Silver Anniversary, leather oyster int, 282 eng w/auto, air AM/FM/cass, PS/PB/PW, t-tops, 58k mi, \$10.5k. Herb, x34325 or 482-3546.

'83 Pontiac Bonneville, orig owner, V8, AC, pwr, \$1.7k. x30912 or 481-2693.

'82 Blazer for parts, 4 wheels w/tires, 4 wheel drive, \$795 OBO; '85 Blazer, \$85. Bryan, 286-7227.

'88 S10 Blazer, 2 dr, 4.3V6, 79k mi, AC, auto, pwr windows, pwr locks, ex cond, \$7.9k. 280-2208 or 486-1049.

Pontiac Parisienne, V8, loaded, pwr, good cond, AM/FM/cass, \$2.5k. Kim, x30223 or 481-6486.

'92 Ford Ranger XLT, blk, ext cab, V6, 5 spd, AM/FM/cass, cruise, tilt, AC, PW/L, alloy wheels dual mirrors, int wipers, 11k mi, ex cond, \$10k OBO. Matthew, 997-1631.

'67 Mustang Convertible, V6, automatic, pwr top, good cond, \$5.3k. 996-5165.

'84 Mitsubishi Cordia, turbo, AC, PS, 5 spd, 102k mi, \$1.4k OBO. Dale, x37984 or 326-3359.

Boats & Planes

'88 18' Four Winns bowrider, 140 hp Johnson, custom galv trlr, extras, ex cond, \$11.9k. 488-5092.

'88 Commercial Johnson 20HP w/low hours; '65 Lone Star 15' V hull, both \$1k OBO. Damon, 283-6911 or 480-5426.

Catalina 25, tall rig, pop top, cruise, air, VHF, depth, new sail covers, new bottom job, Honda 7.5, 2 batt, 5 horsepower, 2 anchors, extras, \$7950. Roger, 326-5543 or Kathi, x38674.

'75 Tournament Ranger bass boat, 85 hp tilt/trim, custom boat/trlr, 2 depth finds, trolling motor, never been in salt water, extras, ex cond. George, 487-5767.

Cycles

Vespa Bravo model moped, 225 mi, \$600. Earl Rubenstein, x34807.

'82 Yamaha X5 400, low miles, windshield, good cond, \$850. 996-5165.

'88 Hurricane, 19k mi, \$2.5k OBO. x34204 or 480-2954.

Audiovisual & Computers

Fluke Model 12 digital multimeter, \$70. Frank, x39924 or 992-3515.

Mac IIcx, 20/40, 100 MB ext HD, 8 bit Apple video card, Sys 6.0.7, 7.0.1, \$1.7k; w/out ext HD, \$1.5k.; 2 MacRecorder digitizers, Sound It Pro, \$300. Carl, x32563 or 333-3176.

Panasonic Model KX-P1124, dot matrix 24 pin, printer, 192 cps, ex cond. 286-8822.

IBM XT, 640k, 10 MB, monitor/kybd, sw, 1 FD, Riteman matrix printer incl, \$650. 337-4182.

JSC

Dates & Data

Today

Cafeteria menu — Special: hamburger steak. Entrees: beef Burgundy over noodles, barbecue smoked link, vegetable lasagna, steamed fish, French dip sandwich. Soup: cream of chicken. Vegetables: buttered corn, steamed spinach, vegetable sticks, navy beans.

Tuesday

Cafeteria menu — Special: turkey and dressing. Entrees: baked meatloaf, barbecue spare ribs, liver and onions, baked chicken, French dip sandwich. Soup: black bean and rice. Vegetables: steamed broccoli, California vegetables, breaded squash, savory dressing.

Wednesday

Cafeteria menu — Special: Mexican dinner. Entrees: Parmesan steak, beef cannelloni, catfish and hush puppies, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: peas and carrots, ranch beans, mustard greens, Spanish rice.

Thursday

Cafeteria menu — Special: smothered steak. Entrees: chicken and dumplings, corned beef and cabbage, broccoli cheese quiche, steamed fish, French dip sandwich. Soup: navy bean soup. Vegetables: steamed cabbage, cauliflower au gratin, buttered carrots, lima beans.

Friday

Cafeteria menu — Special: baked meatloaf. Entrees: baked scrod with Hollandaise, broiled chicken, pork and beef egg rolls, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: stewed tomatoes, seasoned spinach, cut corn, macaroni and cheese.

Monday

Cafeteria menu — Special: Italian cutlet. Entrees: chicken a la king, enchiladas with chili, baked lasagna with meat, steamed fish, French dip sandwich. Soup: split pea and ham. Vegetables: Brussels sprouts, oriental vegetables, buttered carrots, lima beans.

Aug. 3

SOAR '93 — The Space Technology Interdependency Group will present its seventh annual Space Operations, Applications and Research Symposium Aug. 3-5 at the Gilruth Center. For more information, civil servants should call Jane Kremer at x32601; contractors should contact PACE at 282-3030.

Aug. 4

SCOPE meets — The Space Center Object-oriented Projects and Engineering Society will meet at 6 p.m. Aug. 4 in the Forest Room at the University of Houston-Clear Lake. For more information, contact Robert Pelle at 335-6707 or 332-8361.

Aug. 9

NSS meets — The Clear Lake Area Chapter of the National Space Society will meet from 7-9 p.m. Aug. 9 at Freeman Memorial Library. Charles Mullen, chairman of the Houston Inventors Association, will discuss "Twenty Steps to Successful Inventing." For more information, call Marianne at 486-4747.

Sept. 8

Freedom Fighters meet — The Space Station Freedom Fighters will meet at noon and 5 p.m. Sept. 8 and 22 in the PIC room at the Lockheed Plaza 3, 1150 Gemini. For more information, call David Cochran at

482-7005.

Sept. 28

Call for presentations — The final Combined Manufacturers' and Technologists' Airborne Wind Shear Review Meeting will take place on Sept. 28-30 at the Radisson Hotel Hampton in Hampton, Virginia. Presenters wishing to be considered for inclusion on the agenda must submit an abstract to Dr. Victor E. Delnore by July 30. For details, contact Delnore at 804-864-1812.

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.

Oct. 20

Call for papers — The Dual-Use Space Technology Transfer Conference and Exhibition, to be hosted by JSC in February 1994, has issued a call for abstracts, due Oct. 20. The conference, sponsored by JSC, the Texas Space Commission and nine other technical organizations, is designed to share research and technology between the space community and industry. Abstracts should be faxed to: Software and Computer Technology, 282-8076; Human Support Technology, 244-4732; Avionics, Guidance and Control, 483-6120; Propulsion and Power, 483-3204; Communications and Data Processing, 483-6297; Robotics and Automation, 483-3204; Materials Technology, 483-2162; Medical and Life Sciences, 483-6089; and Technology for Technology Transfer, 480-6328. Papers on other topics should be faxed to 244-8589.

Solid oak bdrm wall unit, incl 2 tier chests, hdbd storage area, bridge w/lights, twin mirrors, 4 drwr chest, \$750. Vera, 721-5743 or 282-3561.
Dinette set, heavy glass top tbl, chrome legs, 4 chairs, padded, \$175; tv tbl or for microwave, \$5; pair matching padded chairs, lt weight, cane sides, \$45; stool, \$6. 488-5564.

Contemporary lt peach colored coffee/end tbls, ex cond, \$175; 2 lighted gray pedestals, \$75/ea; variety of contemporary decorating pictures, sculptures. 333-5113.

Mitsubishi lg screen tv, 45", stereo, all features, options, was \$3.3k, now \$1.6k or trade for a working car. 488-0345.

Wanted

Want boys 16" bicycle. Jeff, x30715 or 280-8608.

Want pilot's harness/container, prefer B-4/B-12, must be airworthy, canopy not req'd. Dave, x37176.

Want used whitewater kayak, an cond; want used 1/2" plywood, any grade, cond, or finish. Ronnie, 538-1649.

Wants "Skooter or glass magic "Nomad" bass boat, 13.5 or 15'. 286-6535.

Want person to rent room in Friendswood w/kitchen privileges, nonsmoker, util paid, \$225/mo. x47049 or 480-3424.

Want membership to President & First Lady fitness center; want women's golf clubs. Rob, x35483.

Want roommate to share 2 BR patio home in CLC. \$300, all bills paid. 488-3384.

Want roommate to share lg house in Middlebrook. 480-3167.

Want carpool rider from NW/Bear Creek to JSC/CL, working hours between 7 am to 4 pm. Racquel, x31810.

Miscellaneous

6 panel 8' doors, \$25; other doors, masonite 6 panel, hollow core, steel-glass, \$5-15; glass shelving, beauty products, 50-\$1, toys, trains, telephones, hardware, craft items, signed, numbered prints w/frames, \$10-14. Diane, 283-1858 or 538-2914.

Golf clubs, Spalding executive irons, 3 thru PW, tailor made driver, 10.5 loft, Spalding 5 wood, \$150. 538-2127.

Drafting tbl/chair, early American couch, loveseat, end tbls, coffee tbl, 4 pc bdrm set, w/qn matt/box springs, exercise bike. x30439 or 286-7388.

8" weedeater elec trimmer, was \$35, now \$20; upright vacuum cleaner, good cond, \$100; Sears exercycle, \$55. Ed, x41125 or 481-4889.

Craftsman welder, 30-230amp, wheeled aluminum cart, 30' of cable, \$125. Tom, x37140 or 996-5835.

Smith Corona typewriter, \$50. x32264 or 486-9760.

Win mod 94, 32 spcl, pre-64, \$170. 333-3071.

Kreepy Krawly pool vacuum, needs hose, \$400 OBO; 12' flat-bottomed canoe, no paddles, \$200 OBO; men's suits sz 38 reg/coat, 30" waist, \$75/ea OBO; dishwasher, you pickup, needs minor work, \$10. Jackie, 282-4337 or David, 554-7305.

20' sport net shrimp net, w/gal tub, ex cond., \$100. 771-0955.

Illuminator for x-ray film, mobile, \$150. Laurie, x35590 or 991-0821.

Wht wedding gown, well fitted, sz 6-8, heavy

beaded, bow connected to train, was \$950, now \$450. x39172.

Fully maintained 5 hp self propelled Jacobson lawnmower, 4 yrs old, was \$150, now \$50. 337-4440.

New English saddle, \$325; western saddle, \$285. 409-744-3594.

Qn sz waterbed w/bookcase hdbd, captains drws, motionless matt, less than 1 yr old, \$150; 35 gal triangular aquarium w/stand, incl accessories, \$100. Steve or Ed, 286-3068.

12 volt porter cable cordless drill w/spare batt, \$135. 486-7054.

Wht tea-length beaded wedding gown, chiffon ruffles, sweetheart neckline, sz 6-8, matching hat w/veil, \$250. 282-3842 or 992-3884.

Boat canopy, \$25; 19' boat cover, \$20; DP body tone rowing machine, \$35. Tony, x35966.

Exec desk, computer storage unit/chair, newly refinished walnut desk; plus matching computer, upright storage unit, \$995. Dale, x48179 or 481-0046.

Pair metal folding chairs, \$8/both; vacuum cleaner, \$25; flashing portable sign, \$20; ladies travel case, \$20. 488-5564.

Roof wind turbine, \$5. Mike, x33056.

Reel type lawnmower, was \$70, now \$45; Jimmy Demaree right handed golf club set, 9 irons, 3 woods, puter, w/bag, golf balls/tees, bag-boy pull cart, new umbrella, score card holder, spike tightener, pair of sz 8 golf shoes, blk & wht, \$215; liquor carry out case w/access, \$20; 2 pool or patio lounge chairs, metal frame w/vinyl strapping, \$50; Mens Brunswick bowling shoes, sz 8.5, beige w/carrying case, \$7. Sam, 488-9790.

Blk hole pinball machine, good cond, \$200; removable car stereo, \$25; sewing machine Pfaff auto 260 w/access, manuals, desk cabinet w/chair, ex cond, \$185. 488-4333 or 282-5140.

Four new tires, mounted, balanced, rally wheels, 32.5 x 11 off road tread, fits Chevy 6 lub, 15", \$350. Rogers, x38851 or 944-7042.

Wedding gown w/pearls, sequins, v-neck, chapel length train, sz 6-8, veil, petticoat, \$400; Popup camper, sleeps 6, sink, stove, dining tbl, 12v or 110v elec conn, icebox, \$1.2k OBO; kg sz semi-motionless waterbed, blk leather hdbd, \$400. x36696 or 332-9102.

Hoover upright vacuum, \$20; bicycle child carrier, \$10; 20 gal aquarium, \$25; tbl top ironing board, \$5. 480-3424.

'38 Gas Bird no wing, fuselage/tail, plans, etc, flown by radio, \$40. 534-3021.

Wheels set of 4, 4 lub/4.25, \$65; nosecover, \$20; both fit '84 Ford Mustang GT350; upright freezer, \$65; weight set, \$15; rowing exercise machine, \$25. Vonda, x36372 or 484-2958.

Football tbl, \$75. Tim, 486-0127.

SoloFlex exercise machine, incl extra weight straps, free weights, bar, \$500 OBO. Chris Knight, 332-5629.

Fiberglass camper shell, fits long full sz PU, tan, \$250; Kenmore washer, gas dryer, runs OK, \$50/pr. Tom, x30805 or 944-1143.

Machine shop bar stock/chuck ends, \$125; hydraulic press frame, \$100. 996-5165.

Alpha 215 Windsurfer 12', good cond, \$200 OBO; Bic Windsurfer 10' '81 vintage, \$100 OBO, harnesses, sails, booms, accessories. Greg, x37318 or 333-2699.

Oak cabinet w/lie top, \$50; 16 pc stoneware dinnerware set, \$15; stereo system, AM/FM turntable, \$50; motorcycle helmet, \$20; space heater, \$10; toaster, \$8. 326-3359.

Quick Response

JSC team designs, fabricates hardware for Mir docking mission in whirlwind month-long effort



By Kelly Humphries

This past week, when a Soyuz capsule undocked from its port on the Russian Mir space station, the cosmonauts inside were looking right at a piece of JSC-built hardware that could be crucial to the success of a future shuttle-Mir docking mission.

What's amazing is that the hardware was put together in just over a month by a team of JSC engineers, rendezvous experts and machine shop workers as top managers watched over their shoulders to make sure that the first piece of hardware exchanged between the two countries under new cooperative agreements was as close to perfect as possible.

"This really is a good example of how the system can work and be speedy when it has to be," said the team's rendezvous expert, Lynda Gavin of Mission Operations' Trajectory Operations Branch. "We really cranked this out in a short time frame. Everybody did their part and handed it over to the next guy. Everybody kept watching throughout the whole process to make sure everybody understood everything."

Greg Lange, the project engineer from the Shuttle Cargo Engineering Office, said the whole effort began in January of this year after a suggestion was made at the end of a working group meeting in Russia involving several JSC people.

Under an agreement made last year, NASA is planning to do a shuttle flyby of Mir on STS-63 in June 1994, and dock with the Russian station on STS-71 in June 1995.

"Alignment of the docking mechanisms is critical—that's a visual function that the crew has to do," Lange said. "Looking at the geometry of the two spacecraft and looking at the existing targets that are on Mir, there are really no good targets that we thought would give us good enough alignment cues to have high probability of successful docking."

The best way to correct that, he said, was to put a camera on the center line of the androgynous docking mechanism that will be attached to the Spacelab access tunnel airlock on STS-71. But that requires a corresponding center-line target on the Mir docking port.

The first challenge was to get the Russians to agree that the target was a requirement, and then to convince them to bolt the target onto their docking port hatch.

"We were over there and we just kind of said on a whim, 'Hey, do you guys mind putting on a

target?'" Gavin remembered. "It was an idea we had played with here a little bit but we figured they would not want to modify their hardware. We asked them on a whim and they thought about it for a minute and said, 'As long as we're docked to that hatch, sure, we'll put whatever you want up there.'"

The Russians' deadline, however, was almost immediate because they wanted to install the target while a vehicle was docked, which eliminated the need for a space walk. They needed the target in hand by the middle of March to meet the next scheduled launch of a Progress supply ship.

"We all swallowed real hard and said, 'Can the shuttle program really do hardware that fast?' The answer was yes in this case," Gavin said.

When the group returned from Russia in February, it presented the idea to Tommy Holloway, deputy shuttle manager for program integration, who told Lange to make it happen.

"What made it sporty was we came back from Russia with basically one piece of data, this drawing right here, that gave some existing bolt holes that are in this hatch that the Russians said we could mount to," Lange said.

Based on that single diagram provided by NPO-Energia workers and numerous international faxes and telephone calls, the team immediately set to work on what turned out to be a four-week hardware production schedule. The rest of the time was reserved for shipping the target to Russia, since such a transfer was unprecedented.

"We allotted four weeks to get it built and it turned out to be more difficult than I thought," Lange said. "It turned into a real stretch to meet that date. We just barely made it, but we did it."

Gavin and her proximity operations coworkers sequestered themselves in a room at 3 p.m. one afternoon and came out at 8 p.m. with one diagram of how the target would look—a black and white, 14-inch square plate with a stand-off cross that would stick out 12 inches from the base to provide

angular alignment—basically a fancy version of the robot arm grapple fixture target.

The rendezvous experts stood back and watched Engineering's Structures and Mechanics Division begin the painstaking process of turning their diagram into a stack of engineering drawings that could be used to build a target that would mount to the plate described in the one Russian schematic.

The task of preparing those diagrams fell on John McManamen, the lead engineer and subsystem manager for the hardware, and Chris Lupo, the designer who turned out the engineering drawings.

The simple device would have to be machined, painted and inspected to very fine tolerance by the metal workers in Center Operations' Technical Services Division in Bldg. 9. That team included Richard Hill, George Petter, Mike Hughes, and Tom Hall. Because of the

schedule, they had to start their work with preliminary sketches.

"The shop started cutting metal while Chris and the people over in Bldg. 13 were still doing the drawings," Lange said. "The shop was working on sketches and preliminary drawings." As the final drawings

were being prepared, the designers had to use faxes and telephone calls to verify various requirements, and several times learn about new requirements such as an insulator plate, a shipping container and a custom wrench. The serial steps involved in building the target took longer than expected, and required a lot of extra effort by the designers and fabricators.

"To complicate it even more, it would always take about two to three days to get a response to a fax back," McManamen said. "We'd kind of plan our activities so we couldn't get into too much trouble up to that point, and adjust when we got the details we needed."

Throughout the process, the Russians were "pretty darn cooperative," Lange said.

The team bagged and shipped the target March 5, that then began another challenge that took almost two months to clear up.

"At that time, there were no agreements at the government to government level for shipping hardware like this back and forth for space purposes," Lange said.

The State Department told NASA Headquarters that because there was no formal agreement the best thing to do was to ship the target to the United States embassy in Moscow, which would transfer it to NPO-Energia. But the transfer did not happen as quickly as hoped—in fact, the State Department even shipped the target back to the U.S., and it had to be reshipped to Russia.

"We're sitting there with the hardware there, just watching the time tick away. And we missed the first Progress launch as a result," Lange said.

But at the 11th hour, due to a coincidence of having the right Russian officials in Washington, D.C., for the space station redesign effort, the paperwork was finally approved and the target was placed on the last-chance Progress supply vehicle that launched in May.

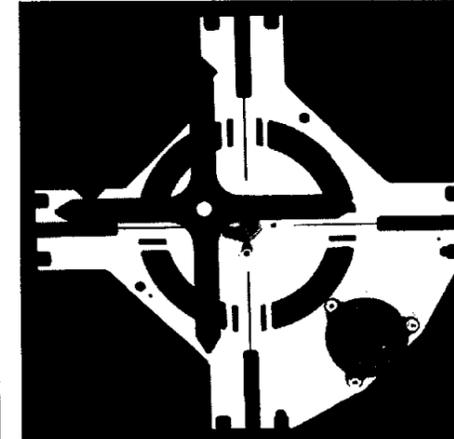
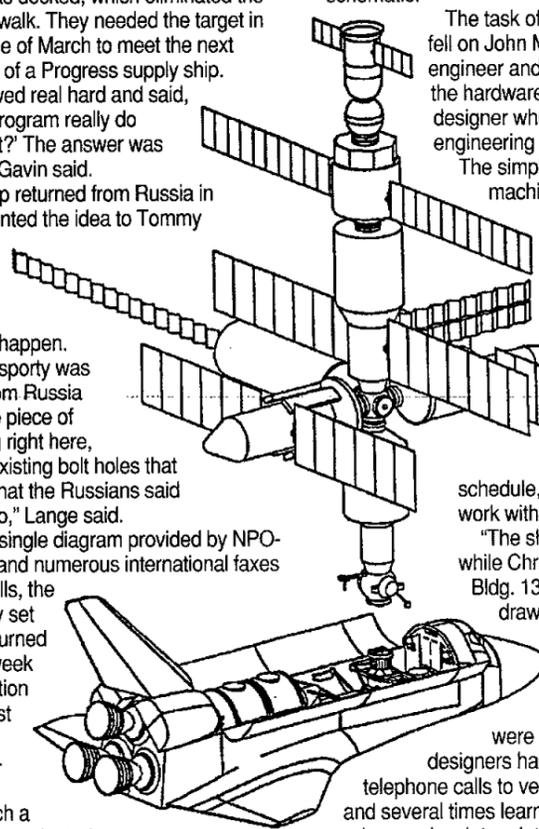
The team, which also included Juan Martinez of the Safety, Reliability and Quality Assurance Office, and workers at Boeing's Flight Equipment Processing Facility who built the shipping container, received word last month that the target had been installed the week of June 21 and looked good. The first look should come in the form of videotape or still photographs taken by the cosmonauts leaving Mir this week.

The pressure on the team had been doubled by the fact that top NASA managers were watching the project closely.

"This is the first hardware we're shipping to the Russians for these cooperative missions, and you sure don't want to have a bad product going over there," Lange said. "We gave them something NASA could really be proud of, made sure it fit the first time."

But in spite of the pressure, the language barrier, the measurement system differences and terminology differences, the team members said they enjoyed participating.

"Everybody looked at it as fun. Go build some hardware to put on the Russian space station. That's not something that comes along every day, so I think everybody was really motivated by that," Lange said. □



Top: Greg Lange sits at the command console in a mockup of the Russian Mir space station during a visit to that country's space program facilities. Left: The JSC team that developed and fabricated a target for an upcoming shuttle-Mir docking mission stands behind its work. Above: The 14-inch-wide target includes a stand-off cross that protrudes 12 inches.

Finney new deputy Aircraft Operations chief

JSC People

David H. Finney has been appointed deputy chief of the Aircraft Operations Division in the Flight Crew Operations Directorate.

Astronaut David M. Walker, a Navy captain, will replace Finney as chief of FCOD's Station-Exploration Support Office.

Finney joined JSC in 1987 as a pilot and head of aircraft engineering in Aircraft Operations. In 1989, he became deputy chief of the Station-Exploration Support Office, and in 1992 he became chief of that office.

Walker recently served on special assignment at McDonnell Douglas Aerospace. Prior to his assignment to command STS-53, he was chairman of the Space

Station Freedom Program Assembly Planning Review, representing FCOD to the Space Station Control Board. Walker also is FCOD manager for all space station, Assured Crew Return Vehicle and Exploration Office involvement.

Karmer leads Life Sciences Projects

Catherine D. Kramer has been appointed chief of the Life Sciences Projects Division of the Space and Life Sciences Directorate.

Kramer began her aerospace career in 1979 as an experimental engineer with Hamilton Standard, where she held several positions of responsibility. She joined JSC in 1987 in the Test Operations and Institutional Safety Branch of the Safety, Reliability and Quality Assurance Directorate, and was reassigned to the Space Station Projects Office in 1988, where

most recently she was manager of the Systems Engineering Office.

Ochoa Hispanic Woman of Year

Astronaut Ellen Ochoa recently received two awards presented by the YWCA of Houston.

Ochoa, who flew on STS-56 in April, was named one of 15 women of the year in June for her achievements in the field of science and technology. The YWCA usually names one Woman of the Year, but the award committee decided to honor a group of women "who brought not only vitality but achievement in the way of decisive milestones to Houston's cultural, charitable and civic life."

This month, she will be honored as the 1993 Hispanic Woman of the Year at the YWCA's ninth annual banquet at the Hyatt Regency Hotel in downtown Houston.



Finney



Walker



McClure



Ochoa

McClure earns top secretary honors

Rebekah L. McClure recently received JSC's Marilyn J. Bocking Award for Secretarial Excellence.

McClure, who has been secretary to the chief of the Space and Center Operations Procurement Division in Administration since 1991, supports four branches and almost 60 employees.

She was honored for providing outstanding guidance to four branch secretaries, and specifically for helping the directorate's training

coordinator develop and implement new procedures for efficient control and documentation of training matters.

Correction

An item in the May 10 People column incorrectly identified Martha Speller, whose son Kevin had won top honors at the Greater Houston Science Engineering Fair.

Speller is chief of the Central Resources Control, Property Accounting and Reimbursable Branch.

Back pats, freedom keys to creativity

By Araceli Olivas

Encouragement, recognition and the freedom to spend time on unofficial work and research contribute to the expression of creativity in organizations, Dr. Sam Stern told a recent NASA-wide continuous improvement colloquium.

Stern, professor of education at Oregon State University, discussed the results of a two-year study on creativity in the research and development sections of two Japanese companies as it related to his theme of "Managing for Organizational Creativity." JSC employees participated in the NASA-wide televised colloquium from a Bldg. 1 conference room.

As an operational guide for his research, Stern defined corporate creativity as "that which takes place when a company is able to go where it has not been before."

He added that the level of creativity is determined by two criteria: high levels of newness and high levels of success relative to the organization itself.

"We cannot use one standard to evaluate creativity in different organizations," said Stern.

Stern emphasized the importance of target setting, stimulus and encouragement in promoting creativity. He pointed to the Japanese track record for rewarding creativity, both in the public and private sector, as an example of stimulus. He also stressed the importance of study leave, which has been a successful form of stimulus in Japanese companies for years. Stern's research found that project initiators were more likely to have had study leave for one year or more.

"Study leave allows employees to go to universities and gain specific knowledge in their fields. They return to work prepared to make the kinds of contributions that can move their companies to new levels of success," Stern said.

Stern used the example of 3M as one company that actively encourages its employees through a policy that asks them to spend 15 percent of their time on unofficial work or research. Stern suggested that the target-setting phase be used as an opportunity to encourage proposals from all employees. He added that there should be a reservoir for keeping projects that are not currently viable but could be in the future.

"Internal motivation is the key," Stern said. "Management must find ways of encouraging unofficial work and research. You can exploit what you've done only for so long. Eventually you need to come up with something new. This is where creativity comes in."

Employees may contact Gay Johnson at x35019 for a tape of the colloquium.



JSC Photo by Jack Jacob

WET SAILING — Col. Guy Bluford is hosed down after his last T-38 flight as a NASA astronaut by an Ellington Field fireman. Bluford, the first African-American in space aboard STS-8, recently resigned from NASA and the Air Force to join NYMA Inc., of Greenbelt, Md. A veteran of five shuttle missions, he has logged more than 688 hours in space. Dousing retiring astronauts has become a Flight Crew Operations Directorate tradition. Frank Marlow, Aircraft Operations duty officer, instigated Bluford's last splash.

Cohen to develop systems engineering courses based on his NASA experience

(Continued from Page 1)

Medal. He is a member of the National Academy of Engineering, a Fellow of the American Astronautical Society and the American Institute of Aeronautics and Astronautics, a Distinguished Alumnus of Texas A&M, recipient of honorary doctorate degrees from Stevens Institute of Technology and from the University of Houston-Clear Lake, and recipient of the American Society of Mechanical Engineers Medal.

Cohen received his bachelor's degree in mechanical engineering from Texas A&M in 1952, and his master's degree in applied mathematics from Stevens Institute of Technology in 1958. He and his wife, Ruth, have three married children and seven grandchildren.

Dr. Herbert H. Richardson, chancellor of the Texas A&M University System and Dr. Kenneth L. Peddicord, interim dean of the College of Engineering, expressed pleasure that Cohen's extensive experience with the U.S. space program now would be applied to the university's programs.

"As a leader in the space program for more than three decades, his unparalleled scientific and programmatic experience will be a gold mine for our students," Richardson said.

"We're thrilled that Mr. Cohen and his vast experiences are coming to the faculty and students at Texas A&M," Peddicord said, noting Cohen plans to develop multidisciplinary courses based on his NASA background aimed at both undergraduate and graduate students.

SES candidates begin training

(Continued from Page 1)

experience in another area of JSC, at another center or other federal agency. They also will spend a minimum of 80 hours participating in formal OPM-approved training.

Blanchard, Huffstetler and Whitelaw already have begun their developmental assignments. The rest will begin theirs in November.

Completing the program does not guarantee appointment to the SES. NASA will continue to have multiple paths of entry in the SES, and all career SES positions will continue to be competed through the SES

vacancy announcement process as they have in the past.

The Senior Executive Service candidates were chosen on the basis of experience, education, training, accomplishments and managerial skills related to six criteria specified by the Office of Personnel Management and an assessment of



Whitelaw

potential skill requirements for the next one to two years.

Applicants were first rated by panels of subject matter experts established at NASA headquarters and each field center. A single agency panel, chaired by Space Shuttle Program Director Tom Utsman, with members from each center and several Headquarters offices, took a closer look at the applicants from NASA, other government agencies and private industry. That panel made selection recommendations to the Executive Resources Board, which made the final selections.

Hubble finds double nucleus in Andromeda

A team of astronomers using NASA's Hubble Space Telescope has discovered a "double nucleus" in the center of the neighboring spiral galaxy M31 in the constellation Andromeda.

A nucleus is a dense clustering of stars at the very center of a galaxy.

The astronomers report that the brighter member of the double nucleus might be the remnants of another galaxy cannibalized by M31. They say that an alternative possibility is that dust might dim the core to create the illusion of a pair of separate star clusters.

"The Hubble images intensify the mystery of what's happening in the center of this galaxy," said Dr. Tod R. Lauer of the National Optical Astronomy Observatories, Tucson. "Neither interpretation offers a complete explanation of the M31 nuclear structure."

The HST pictures show two bright spots at the heart of the M31 galaxy. The dimmer of the two "light-peaks" appears to mark the exact center of the galaxy. The brighter peak is at least 5 light years away from the true center, but corresponds to what astronomers previously had thought was the nucleus of M31, based on ground-based observations.

Well-known as the Andromeda Galaxy, M31 is only 2.3 million light years away, making it the nearest major galaxy to the Earth's own Milky Way. As seen from large ground-based telescopes, the M31 starlight blends to resemble a single bright, almost point-like source. Previous ground-based observations gave little hint of the true structure of the core, which is now revealed by Hubble.

M31 is an ideal target for Hubble once the telescope's optics are improved during a Space Shuttle servicing mission in December. Spectrographs aboard Hubble will dissect the light from the two peaks of the double nucleus and determine if they are truly separate clusters. Astronomers will be able to measure the velocity of stars to pin down whether there is a black hole in either or both.

EVA to test tools

(Continued from Page 1)

with an on-time Saturday launch.

Discovery will retrieve the ORFEUS-SPAS six days later, once it has completed its observations regarding the formation of stars, and return it to Earth. On the fifth day of the mission, Walz and Newman will perform a six-hour space walk to expand space-walking experience among astronauts, controllers and trainers, test some tools expected to be used in the mission to service the Hubble Space Telescope later this year, and refine space-walk training and planning methods.

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