



Space News Roundup

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No. 2

Truly approves new center roles, missions

Changes mark new era for JSC with focus on space station, exploration

By Kelly Humphries

NASA Administrator Richard Truly has given the go-ahead for changes in the roles and missions of the agency's field centers, effective immediately.

JSC becomes the lead center for the Space Exploration Initiative and Space Station *Freedom's* shuttle-tended phase as the agency returns to the lead center concept for program execution. JSC also will retain important roles in the development and operation of piloted spacecraft, and research into the effects of space

travel on human physiology.

As expected, Kennedy Space Center will be the lead center for the space shuttle, which will result in the transfer of a small number of shuttle program workers to KSC. Shuttle Program Director Leonard Nicholson already has begun that move.

Centers are now beginning their detailed assessments of what the broadly written changes will mean, and Truly has set deadlines for implementation plans for the new roles and missions assignments, which were

recommended by outgoing Deputy Administrator J.R. Thompson in November.

"These decisions mark the dawn of a new era for this center," said JSC Director Aaron Cohen, who was a key player in the roles and missions discussions. "We have completed our latest assignment of developing a first-class reusable space transportation system and now it's time for us to move on to the next challenges — erecting a space station and developing a program that will take us back to

the Moon and on to Mars. JSC will have a strong role in the manned exploration of the solar system and in the development of the vehicles that take us out there.

"A few people who now work for the shuttle program at JSC will move to KSC — somewhere in the range of 20 to 40 — but those losses will be offset by gains in the space station and lunar-Mars program areas," he said. "And JSC will keep responsibility for astronaut training, mission con-

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JSC Roles, Missions

Lead Center

- ✓ Space Station *Freedom* (Shuttle-tended Phase)
- ✓ Space Exploration Initiative

Center of Excellence

- ✓ Manned Space Operations
- ✓ Extraterrestrial Outposts
- ✓ Piloted Spacecraft
- ✓ Small Chemical Propulsion
- ✓ Life Sciences Research
 - Human Physiology
 - Operational, Clinical Medicine

Discovery, crew complete final dress rehearsal

By James Hartsfield

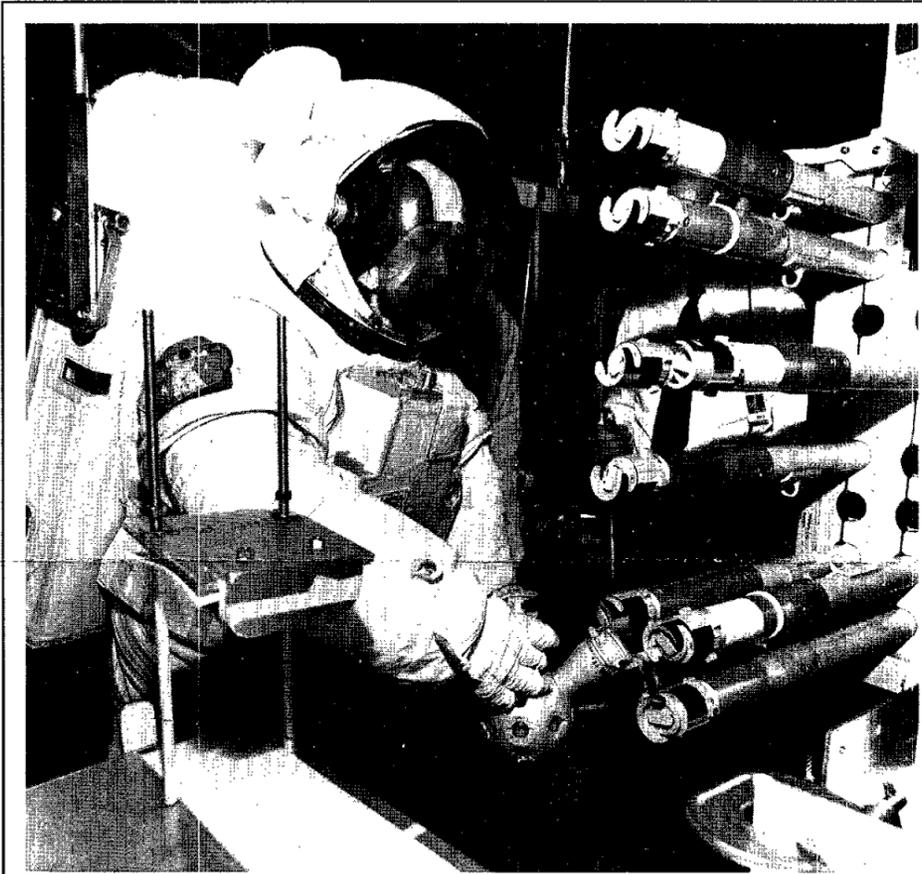
With a flawless countdown rehearsal complete, shuttle managers Thursday set an official launch date of Jan. 22 for *Discovery* on STS-42.

Preparations at Launch Pad 39A continued to go smoothly as managers met for the Thursday flight readiness review, a final thorough review of all mission preparations. The seven-day flight scheduled to land at Edwards Air Force Base.

An on-time launch at 7:53 a.m. CST Jan. 22 would call for a landing at 9:05 a.m. CST Jan. 29 at Edwards. The crew of *Discovery* — Commander Ron Grabe, Pilot Steve Oswald, Mission Specialists Norm Thagard, Bill Readdy and Dave Hilmers, and Payload Specialists Roberta Bondar and Ulf Merbold — left Florida Tuesday after completing the countdown dress rehearsal.

Work on *Discovery* now enters the home stretch at the pad, with technicians loading fuel into the spacecraft's orbital propulsion systems.

Elsewhere at KSC, preparations of *Atlantis* for a March flight on mission STS-45, carrying the Atmospheric Laboratory for Applications and Science. This week, work centered on tests of the Ku-band antenna, the electricity-generating fuel cells and radiators. And work on *Endeavour*, scheduled for a first flight in April, continued with the replacement of an airlock hatch seal, leak checks of the life support system and tests of the flash evaporator system.



JSC Photo by Mark Sowa

ERECTOR SET — Astronaut Kathy Thornton goes through a dry run for a vacuum chamber test of procedures that will be used for the Assembly of Station by EVA Methods payload on STS-49. Thornton is working with the struts and joints that will be used to test extravehicular activity assembly techniques. The tests were conducted recently in Bldg. 32's Vacuum Chamber B. ASEM currently is scheduled for the first flight of the new Space Shuttle *Endeavour* in April.

JSC workforce to remain steady despite cutbacks

By James Hartsfield

A gradual 15 percent reduction in the Space Shuttle Program's nationwide budget over the next five years will have little if any impact on the total number of workers at JSC because it will be offset by Space Station *Freedom's* move toward operations and other new agency initiatives, JSC Director Aaron Cohen said Tuesday.

"All areas of the shuttle program have been given a target to reduce their budgets by 3 percent each year during the next five years, and that includes JSC. As we reduce the amount spent on shuttle, we increase the resources available for Space Station *Freedom* and downstream programs," Cohen said. "As a result, we don't expect the changes in shuttle to have any net effect on the total number of employees in our workforce, both contractors and civil servants."

"JSC has the lead role in *Freedom's* early development, the shuttle-tended phase, and is the lead center for SEI," Cohen added. "Any jobs that are reduced in shuttle will be made up for by the immense amount of work we have before us in these areas."

The space shuttle is a mature program and its operating costs should reflect more efficient operating concepts, Cohen said. Although reduced spending on shuttle will mean fewer workers in that area, normal attrition and increasing activity on space station will tend to absorb the affected personnel.

"In any event, we don't see any layoffs in the shuttle program in 1992," Cohen said, "and, although we are affected by the reduced spending, these changes will be gradual, accomplished over a period of years."

Space Shuttle Program Director Leonard Nicholson said the nationwide cuts in the shuttle program are aimed at reducing the shuttle's annual overall spending by

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Government employees to receive salary increase Sunday

JSC workers, along with all other government employees, will start the year with a 4.2 percent salary increase effective Sunday.

President George Bush authorized the pay increase for all general schedule and general management employees Dec. 26, 1991, however employees will not see the change in

their checks until Feb. 4.

For an employee at the GS-7, Step 1 level, the increase will mean a raise of \$883 per year, or about \$34 in gross salary each pay period. For an employee at the GS-9, Step 1 level, the increase will mean a raise of \$1,081 per year, or about \$41 in gross salary each pay period. For an

employee at the GS-12, Step 1 level, the increase will mean a raise of \$1,567 per year, or about \$60 in gross salary each pay period.

Employees paid under special salary rate schedules such as medical officers and most GS-7 through GS-12 engineers also will receive a 4.2 percent raise. Official word on

those increases was delayed slightly by the Office of Personnel Management. The Human Resources Office is in the process of notifying those individuals that the increase has been officially approved.

For more information, contact Curtis Collins at x33002, or your Human Resources representative.

Magellan transmitter fails at Venus

Probe already has mapped more than 95 percent of surface

After completing 15 months and 3,880 orbits and successfully mapping more than 95 percent of the surface of Venus, the Magellan spacecraft appears to have suffered a component failure in one of its two downlink transmitters.

The problem has temporarily halted the reception of mapping data since 5:39 a.m. CST Saturday. Engineering data is still being received, however, and the spacecraft is in good health.

The failure occurred following a routine star calibration. Immediately afterward, spacecraft controllers switched to the back-up

transmitter that was turned off in March 1991 because of degraded performance. The backup transmitter was operated for 25 minutes and returned good mapping data.

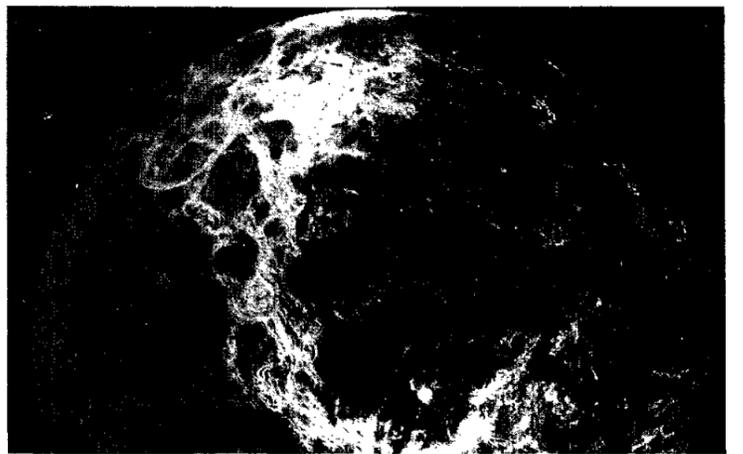
As is normal, the transmitter temperatures rose. But at higher temperatures, the backup transmitter showed degraded performance. Signal strength from the back up showed some indication of decreasing near the end of the test period, a symptom seen before when the unit was at higher temperature. The backup transmitter was turned off and the prime transmitter was turned on again.

Controllers and project officials this

week have been trying to work out a strategy for use of the backup transmitter for mapping data.

When Magellan was launched from the Space Shuttle *Atlantis* in May 1989, the primary mission objective was to map 70 percent of the planet's surface. The spacecraft completed its prime radar mapping mission on March 15, 1991. On Jan. 15, 1992, the spacecraft will have completed its second mapping cycle. Magellan has mapped to date more than 95 percent of the planet with high-resolution radar.

The transmitter problem does not endanger the gravity mapping objective planned for later this year.



NASA Photo

Magellan's synthetic aperture radar has been used to create mosaics such as this one showing the data projected on a computer-simulated globe.

JSC

Ticket Window

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

General Cinema (valid for one year): \$4.
 AMC Theater (valid until May 1992): \$3.75.
 Loews Theater (valid for one year): \$4.
 FBA Rockets vs. Los Angeles Clippers (7:30 p.m. Jan. 23, Summit): \$6.
 FBA Entertainment '92 (coupon book): \$27.

JSC

Gilruth Center News

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

Weight safety — Required course for employees wishing to use the Gilruth weight room. The next classes will be from 8-9:30 p.m. Jan. 29, and Feb. 6 and 20.

Defensive driving — Course is offered from 8 a.m.-5 p.m. Feb. 29 and March 21. Cost is \$19.

Aerobic dance — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32.

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

Aikido — Martial arts class meets Tuesdays and Fridays beginning Jan. 7. Cost is \$35 per month.

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

JSC

Technical Library News

The following selections are now available in JSC's Technical Library, Bldg. 45, Rm 100.

Chemical Compatibility and Environmental Stress Crack Resistance. New York: Plastics Design Library, c1990. TP1130 .c353 1990.

NASA's Productivity Improvement and Quality Enhancement Initiatives. September 1982 through Sept.ember 1984. Washington D.C.: NASA, 1984. TS156.A2 N37 1984.

Achievement Through Team Excellence. Houston, TX: Lyndon B. Johnson Space Center, 1989. TS156.6 .A34 1989.

Beyond the Dream: A Celebration of Black History. Houston, TX: NASA Johnson Space Center, 1989. E185 .B49 1989.

Management's Five Deadly Diseases: A conversation with Dr. W. Edwards Deming. Chicago, Ill.: Encyclopedia Britannica Educational Corp., 1984. HD70.U6 R61 1984.

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

Lease: CLC, Meadowgreen, 4-2-2, FPL, blinds, formals, den, fenced, bay window, area pool and tennis, \$885/mo. 280-8796.

Lease/Sale: CLC, Baywind II condo, lg 2-2-2, new carpet, blinds, paint, FPL, wet bar, W/D, tennis, pools, exercise rm, \$575/mo. 280-8796.

Lease: Barringer Way, 2-1, W/D conn, pool, storage area, no pets, \$425/mo. 486-2048.

Rent: Galveston condo, furnished, sleeps six, Seawall Blvd and 61st St, pools, cable TV, wknd/wkly/dly. Magdi Yassa, 333-4760 or 486-0788.

Sale: Friendswood, two lots, 0.95 acre, all util, no flooding, \$32K and \$39K, \$59K/both. Ron, 996-9724.

Lease: Meadowgreen, 4-2.5-2, 2145 sq ft, ceramic tile floors, Stainmaster carpet, FPL, microwave, fans, fence, deck, patio, boat pad, \$1250/mo plus \$1250 dep. 282-4294 or 280-8580.

Lease: CLC townhouse, 2 story, 3-2.5-2CP, W/D, cable hookup, sm fenced backyard, avail Jan 6th, no pets, \$725/mo. 946-7793.

Lease: 145 at Fuqua, 3-2-2, remodeled, \$595/mo. Minh, 333-6806 or 484-2456.

Lease: CLC, 1 BR condo, FPL, microwave, W/D conn, fan, appli, tennis, exercise rm. Jim Briley, 335-4389 or 488-7901.

Sale: El Dorado Trace condo, 1-1.5-1CP, appli, patio, balcony, FPL, fans, designer wallpaper/carpet, assum loan. Jeane Wright, 991-0237 or 761-3622, pager.

Sale: Egret Bay condo, 2-2, covered parking, all appli, FPL, blinds, fan, patio, storage, pools, boat ramp, \$39.5K. 333-

9281 or 481-3637.

Sale: Baywind One condo, 1-1-1, fans, dishwasher, range, refrig w/ice maker, \$28K. Bill, x39376 or 487-4537.

Estate sale: .5 acre, house in Abilene Texas, 2 furnished apts, owner finance, \$39K. 332-2229.

Sale: Baywind II, 2-2-2, \$39.5K; University Trace, 1-1-2, \$29.5K, all appli, FPL, W/D. Gilbert Chavez, 333-4306.

Rent: Baywind II condo, 1-1, W/D, refrig w/ice maker, microwave, dishwasher, \$425/mo. Steve, 244-7474 or 486-8047.

Rent: Heritage Park, new section, 3-2-2, \$850/mo; lease: CLC townhouse, 2 story, 2-2.5-2, FPL, patio, good cond, \$750/mo. 289-6777.

Cars & Trucks

'80 Pontiac, V6, A/C, 4 dr liftback, auto trans, AM/FM/stereo, good cond, \$1450. 481-3637.

'80 Datsun 510 S/W, maint records, shop manual, good cond, 110K mi, \$1550. Bob Sampson, x34613.

Jeep hardtop, factory blk, doors, blue/grey, BO. Rich, x34818 or 480-8335.

'86 BMW 325, loaded, sunroof, ABS brakes, dark blue, ex cond, \$10K OBO. Bill, x38378 or 992-5415.

'88 Toyota Camry wagon, 73K mi, ex cond, \$7K. 480-3330.

'83 Buick LeSabre Limited, A/C, all pwr, 94K mi, ex cond. Jim, 332-5725.

'88 Chevy S-10 PU, auto, V6, 4.3 fuel inj, 25K mi, snug-top shell, loaded, ex cond, \$9K OBO. Tom, x36910 or 286-7001.

'91 GEO Storm hatch, air bag, 5 spd, A/C, AM/FM/tape, \$8.9K OBO. x36149 or 334-1303.

'85 Mercury Cougar, blk, auto, ex cond, 106K mi, \$2.5K OBO. Keith, 480-2817 or 333-2203.

'65 Mustang, 289, 3 spd, A/C, orig eng, good paint, \$5.5K. x30079 or 286-0303.

'83 Supra, \$2.5K. x36463 or 554-6104.

'84 Ford Ranger XL, V6, 5 spd, A/C, longbed, P/S, P/B, cruise, AM/FM/stereo, 82K mi, \$2.6K. x37999 or 486-7245.

Today

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

Monday

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

Tuesday

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

Wednesday

IEEE tutorial — The Education Committee of the Institute of Electrical and Electronics Engineers Galveston Bay Section will present a tutorial on "Optics in Information Processing and Computing" from 8:30 a.m.-12:30 p.m. Jan. 15 at the Gilruth Center. Dr. John A. Neff of the Optoelectronic Computing Systems Center at the University of Colorado, Boulder, will discuss fundamentals, basic devices and components and applications. Reservations for the free tutorial are due by Jan. 13; call Marcia Taylor, x30195.

Astronomy seminar — The JSC Astronomy Seminar will present an open discussion meeting at noon Jan. 15 in Bldg. 31, Rm. 129. For more information, call Al Jackson at 333-7679.

AIAA meets — The American Institute of Aeronautics and Astronautics' Education Committee will

Dates & Data

meet at 10:15 a.m. Jan. 15 at the Gilruth Center. Nadine G. Barlow, planetary geoscientist, will present "More About Mars." Reservations for the free lecture are due by noon Jan. 12; call 333-6064.

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

Thursday

Lunch and learn — The American Institute of Aeronautics and Astronautics' Human Support Technical Committee will meet at 11:30 a.m. Jan. 16 in the Bldg. 3 cafeteria. Tandi Bagian will discuss "Human Factors at JSC." For more information, call 283-6536.

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

Jan. 17

SSQ meets — The Society for Software Quality Houston Chapter will meet at 5:30 p.m. Jan. 16 at the American Host Hotel. John Garman, deputy director of JSC's Information Systems Directorate, will discuss "Customer Expectations in Software Quality." Dinner reservations are due Jan. 13; call Nancy Falk, x32381.

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

Jan. 23

AIAA meets — The Houston section of the American Institute of

Aeronautics and Astronautics will meet at 5:30 p.m. Jan. 23 at the Gilruth Center. Dr. Virgil Sharpton of the Lunar and Planetary Institute will present "Venus Revealed: Magellan Results." Cost is \$9 for members, \$10 for non-members and \$8 for students and young members. Dinner reservations are due by noon Jan. 20. For more information, call 333-6064, 283-4214, 283-6000 or 282-3160.

Jan. 29

AIAA/IEEE seminar — The local sections of the American Institute of Aeronautics and Astronautics and the Institute of Electrical and Electronics Engineers will present a special seminar on "Space Activities in the College of Engineering at the University of Houston" from 10:30 a.m.-12:30 p.m. Jan. 29 at the Gilruth Center. For reservations to the free seminar, call Frankie Hap, 333-6064.

Jan. 30

Lunch and learn — The American Institute of Aeronautics and Astronautics' Ground Testing and Simulation Technical Committee will present a lunch and learn meeting at 11:30 a.m. Jan. 30 in the Bldg. 3 cafeteria. JSC's Jeanne Crews and Eric Christensen will describe the JSC Hypervelocity Impact Testing Facility. For more information, contact S. Arepalli at x35910.

June 1

Fuzzy logic workshop — JSC and the University of Houston-Clear Lake will host the third International Joint Technology Workshop on Neural Networks and Fuzzy Logic June 1-3, 1992 at the Gilruth Center. For more information, call Carla Armstrong, x39071.

Miscellaneous

Two President First Lady Gold Charter memberships, \$6.30/mo renewal fee, no increase, \$600/ea. Andy, 482-3078.

O'Neil "Reactor" wetsuit, ex cond, \$100. David or Bill, 554-6242.

"Karen Silton" long brown leather coat, ex cond, \$150. TJ, 333-5107.

Girls 18" Huffy bicycle, \$35; scooter, \$25. 280-8580.

New Dooney and Burke pouch, pear green, warranty, \$120; new eelskin coach bags, navy, burg suede lined w/shoulder strap, \$120; eelskin wallets, breast pocket and men's billfold style, \$35. x30003 or 644-3137.

New child's ski suit, sz 12, matching bib, jacket, gloves, ex cond, \$70; alum camper shell for midsize PU, standard length, \$90. 283-4087 or 480-3110.

Double stroller, \$75; tool box for small PU, \$50. Tom, x31710 or 538-1581.

Golf clubs, like Hogan Edge irons, \$160 for 1 thru SW, metal woods, \$30/ea. David, 554-5514.

Babytend lightweight stroller, blue, good cond, \$20; Graco Totwalker III, toybar, confetti print, red trim, ex cond, was \$60, now \$25. Kim Keleman, x49850 or 244-9850.

Telephone answering mach, ex cond, \$25; Craftsman portable workbench, \$25; lightweight exerciser rower, \$10; two bar stools, \$5/ea, 3 ft x 4 ft mirror, \$10. Edward, x36250 or 481-4889.

Precor 730e stairclimber, ex cond, \$450; Schwinn Air Dyne exercise bike, ex cond, \$600 OBO. Cindy, x35903 or 332-0427.

Jog stroller w/removable canopy, \$200. Mike, x34107.

President & First Lady Charter Gold membership, \$700. 480-6713.

Marmink ladies full length fur coat, ex cond, \$250; antique blue venetian glass ceiling fixture, 4 lights, \$100; new lg Peruvian Llana handmade wall hanging, figures woven in, \$75; new Oleg Cassini 4" executive briefcase, \$50; elec heavy duty hedge clippers, ex cond, \$25; VHS tape rewinder, \$10; large barometer w/built-in clock, approx 2.5 ft high, \$35. 488-5564.

'86 Mercury Cougar, red, auto, loaded, ex cond, 88K mi, \$3.9K OBO. Mike, x31907 or 332-0446.

Boats & Planes

'86 Southern skier, 351 PCM I/B, low hrs, new int, stereo, Magnum trlr, \$8950. Ralph, x34736 or 772-6506.

Cycles

Kawasaki EX500 sport bike, Ninja style lower faring, Nady alarm sys, maint records, 3K mi, ex cond, \$3K. x38841 or 326-5446.

'91 Suzuki Bandit, garaged, ex cond, \$2.9K. 480-6713.

Audiovisual & Computers

Amiga 1000 CPU monitor, keyboard, mouse, external dr, SW, 1 meg on motherboard, \$600 OBO. Jon, 283-0283 or 488-8038.

T1855 ptr w/tractor push, sheet feed, 2 plug-in cards, service/owner manuals, ex cond, \$100 OBO. 946-4013.

RCA 19" color TV, good cond, \$75. x37999 or 486-7245.

Sony 5-disc player, CDP-C50, 4x sampling, remote control, \$150; Samsung amber moni w/Addonics Hercules compatible card, \$50. Ralph. x34736 or 772-6506.

386 w/super VGA, 1.2 MB floppy, loaded w/SW. Robin, 333-7345 or 474-2339.

New MAC IIci 5/80 SS, 7.0, Magnavox 14" color moni, extended kybd, SW, asking \$4.1K. M. Beard, x31793 or J. Sjurseth, x31677.

Musical Instruments

Jackson bass guitar, custom paint, neck thru body, active elec, \$450; 1x15 tuned port bass cabinet, new JBL speaker, \$200. x36149 or 334-1303.

Ovation 6 string acoustic/elec guitar, ex cond, hard case, \$600; PV Bandit amp, \$150 or \$700/set. Kevin, x35191 or 320-2410.

Pets & Livestock

Kittens, 8 wks old, gray/whit, \$5/ea. 337-7504.

Free kittens, 2 smoky gray, 1 blk. Alyssa, x39546 or 334-4220.

AKC siberian husky pups, 4 males, 4 females, blk/wht, ready 1/23/92, \$200 deposit. 991-5280.

Household

Full sz sofa, rattan armrests, pale green, peach upholstery, \$75 OBO. Jennifer, 283-5304 or 286-0901.

Sears upright vacuum cleaner, extra bags, \$25 OBO. Leonard, 282-4044 or 333-5576.

Chromecraft dinette set, 48" round tbl, 4 swivel chairs, ex cond; GE elec skillet w/book, qz sz matt/box springs. 286-8822.

New Bund bed/chest w/matt, desk, chair, L-shaped, solid wood, was \$780, now \$395. 337-7504.

Gas stove, good cond, was \$400, now \$250. (409) 849-3791.

Solid pine 6 pc kg sz bookcase waterbed, 6-dwr pedestal, 2 pc dresser, chest, 3 sets sheets, \$650. Velour recliner, ex cond, \$75. 485-1931.

Dinette set, rattan glass table, 4 newly reupholstered chairs, \$200. Eileen, x38604.

New Cherrywood kg BR suite w/tall post hdbd/ftbd, double dresser w/mirror, lingerie chest, 2 nightstands, was \$3K, now \$1.8K; Cherrywood dining rm set, 6 chairs, fabric scotchguarded, 2 leaves, 2 piece china cabinet, was \$3.2K, now \$1.8K. Dee Collins, x34691 or 434-1898.

Wanted

Want female roommate to share 3 BR house in Southshore area, \$325/mo plus 1/2 elec/phone. 538-3320.

Want broken down blue "power wheels" brand elec car w/battery, will pay \$25-\$50. Phil, 283-5648.

Want 3-2-2 home in Pipers Meadow or CLC w/assum, no approval loan, \$70K-\$80K. x31826 or 480-9436.

Want to carpool to UHUP for Spring '92 semester, Tues/Thurs, lv JSC 4:45 pm, arr UHUP 5:15 pm; lv UHUP 8:30 pm, arr JSC 9:00 pm. Nancy, x38275 or 480-4634.

Want riders to vanpool, West Loop Park & Ride to NASA. Richard, x37557.

Want non-smoking roommate to share 3 BR house in CLC. \$250/mo plus 1/2 util. Rich, 480-2570.

Reel-Time Analysis

JSC shuttle photography and television project uses unique perspective to frame answers

By James Hartsfield

It takes a quick eye to discern something out of the ordinary when almost 8 million pounds of thrust are released in under six seconds to loft a shuttle to space — so quick that more than five miles of film are used to assist those at JSC charged with the task.

Workers in the JSC Space Shuttle Photography and Television Analysis Project use film from more than 70 cameras around the launch pad plus video from another 25 television cameras to put each launch in perspective. And the perspective is one seen by only a few.

They see the three main engines slowly roar to life one by one, first in distorted yellow flame, slowly turning orange before, finally, familiar bright blue diamonds pull into focus behind the nozzles. The nozzles themselves flex and rebound like rubber from the force.

They see shreds of debris fly from around the engine nozzles and discern if indeed, it is common debris such as paper or ice, or some item not meant to move. The solid rockets' ignition is heralded at first by puffs of smoke from pyrotechnic ignitors that release bolts holding the shuttle to Earth. And on the way to space, the craft generates an odd array of shock waves and reflections, some trailing from wings and tail like condensation and some in perfectly straight horizontal lines moving up and down the vehicle, a phenomena not totally understood called the linear optical effect.

The film cameras that capture these moments take up to 400 individual photographs per second. When the film is projected at the normal projection speed of 24 frames per second, the result is an event that occurs almost 17 times slower on screen than in real life. Just as a look through a microscope opens a new world of the very small, high-speed film slows down a world of the very fast.

In the project's Bldg. 31 Image Analysis Laboratory, up to 26 seconds of video can be digitized almost instantly using the Gould Image Processing System and Real-Time Disc. Film also can be digitized, although not as quickly. Digitizing the footage allows technicians to dissect the images.

"We can view it one frame at a time. We can enhance the picture, sharpen the edges and we can track objects from frame to frame to develop the trajectory of a piece of debris or determine where it came from," Chris Dailey, supervisor of the project, said. Computer-aided design drawings can be overlaid on the video as well, she added.

"Usually, if an event occurs, it occurs in two to three seconds, so we are able to isolate the incident and study it," Dailey said. "We can measure the size of an object using the camera's location, the camera's focal length and where it is pointed. We can also measure the size by scaling an item to other things in the picture with a known size."

The project is a result of lessons learned from the *Challenger* accident, and the equipment it employs was used to assist in analyzing that accident and pinning down the exact cause. Now, a total of 15 people work in the project. STS-26 was the first launch watched in real time by the analysts, Dailey said.

For a mission, work begins in the lab at T-minus 6 seconds, when the main engines ignite. As a group, all eyes in the project watch the launch live on NASA Select for any cues or

improprieties that may need a closer look. Engineers in the Bldg. 30 Mission Evaluation Room may call the lab with requests to study an event.

Within 30 minutes after launch, replays from 19 television cameras, each with a different angle, are transmitted on NASA Select to the lab, and work begins in earnest. The project's analysts watch and record the replays, and they can immediately digitize almost a half minute of video for a closer look, Dailey explained. Six hours later, a new batch of video, from six long-range trackers, is transmitted.

The day after launch, 20 films arrive at the lab. And 20 more arrive the day after, and so it goes for the next three days. By five days after liftoff, the analysts have reviewed every image taken of the launch, Dailey said. Each night, a written report on the day's findings is provided by the group to the Mission Management Team and the Mission Evaluation Room.

"Every mission is new; there is some new challenge each time," she added. "With each new problem, you have to use different techniques to find the answer. I enjoy the problem-solving. Every mission is a learning experience."

Among the work the lab has performed is an analysis of the causes of tile damage seen on STS-27; a study of body flap movement during STS-28's climb to orbit; studies of liquid hydrogen leaks seen on the pad during attempts to launch STS-38 and STS-35; and an analysis of the external tank's reentry into the atmosphere on STS-31.

Subjects that are looked at on each mission include plume recirculation by the solid rockets, debris in the pad's flame trench, and the external tank's condition after separation.

One recent in-flight question the lab was integral in answering was a loose payload bay aft seal seen in orbit on STS-40. Using three camera views, the lab determined how far the seal protruded from the bulkhead, allowing a simulation at KSC. The simulation revealed the seal would cause no trouble as STS-40 packed up for landing.

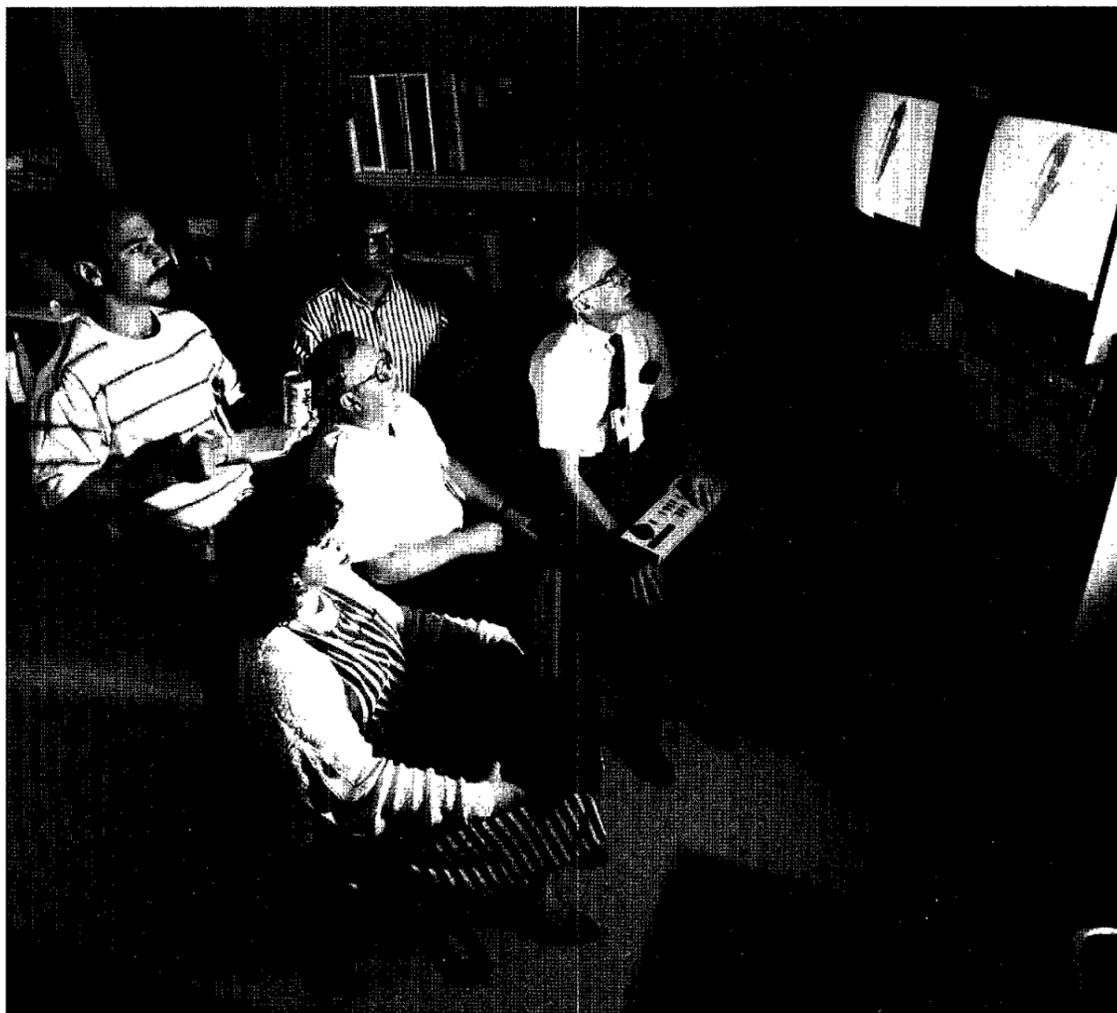
"You hate to draw any conclusions from a single camera view or a single piece of film," Dailey said. "That's why we like to look at a lot of videotape and film and have a convergence of evidence."

The lab also analyzes up to 10 videos and 15 films of landing, watching for any improprieties and checking standard measurements such as the orbiter's sink rate at touchdown.

Similar analysis is performed at Kennedy Space Center, Marshall Space Flight Center and by Rockwell. KSC's lab looks at pad equipment during launch and debris from the orbiter as it leaves the pad. Marshall's effort concentrates on the solid rockets, external tank and main engines. And Rockwell concentrates on the orbiter.

JSC's lab incorporates all elements of the shuttle and the mission. Through an intercenter working group, the four analysis labs coordinate their efforts during a flight. At times, two labs may study a certain question and compare their results as a method of double-checking the findings, Dailey said. However, JSC's facility is the only lab with the ability to instantly digitize video. The computerized images can be transferred immediately via telecommunications between KSC, Marshall, JSC and Dryden Flight Research Facility.

"When there's a problem, everyone works together on it," Dailey said.



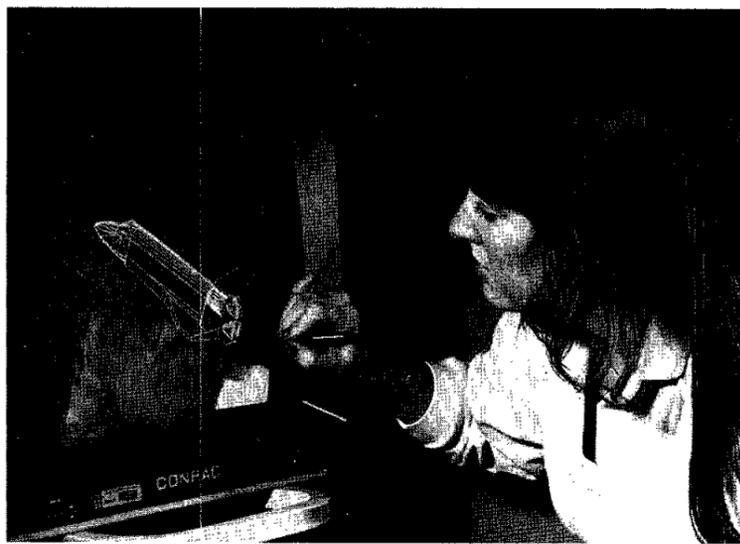
Above: Photo and TV analysis workers Steve Israel, Teresa Morris, Jack Hartman, Ranjit Bhaskar and Jon Disler, from left, screen videos of a shuttle launch in the project's Image Analysis Lab in Bldg. 31. Right: Chris Dailey, supervisor of the Space Shuttle Photography and Television Analysis Project, and Mike Snyder, an imagery analyst, analyze film of a recent shuttle launch.



JSC Photos by Robert Markowitz



Above: Holly Harless, an imaging technician in the JSC Space Shuttle Photography and Television Analysis Project, prepares to digitize a photograph for computer analysis. Right: Image Analyst Lisa Rovinelli uses digitized video of a shuttle launch and a computer-aided design overlay to evaluate *Atlantis'* recent climb to orbit on STS-44.



JSC Exchange to sell discount Metro passes

The JSC Exchange Store in Bldg. 11 will begin selling discount Metro passes and ticket books on a trial basis starting Jan. 23.

The service is expected to benefit commuters traveling to NASA from all areas of Houston, as well as spouses of NASA employees who commute into downtown, said NASA Exchange Operations Manager Teresa Sullivan.

Metro personnel will be available to discuss services from 11 a.m. to 1 p.m. Wednesday in the Bldg. 11 cafeteria, she said.

The good news for downtown com-

muters is that NASA civil service or contractor employees will be able to buy Metro passes or ticket books for themselves or family members at a 7 percent discount. The discount passes can be used at the Bay Area Blvd. Park and Ride.

The monthly pass costs \$90.62, the 40-ride ticket book is \$91.69 and the 10-ride ticket book is \$22.92. Ticket books are valid for three months. Transfers to other routes from the Park and Ride route are free.

Single tickets will not be sold in Bldg. 11, but may be purchased at Fiesta,

Randall's or Kroger for \$2.90 one-way.

"Reverse commuters" to JSC from Katy, Kingwood or any other part of the greater Houston area, will be eligible for an additional discount over and above the 7 percent discount. Here's how it works:

The fare from downtown to NASA on the Bay Area Park and Ride route is an express fare of \$1.20 one-way, or \$39.33 for a one-month pass or \$9.57 for a 10-ride ticket book. If your originating bus from home to downtown is a Park and Ride or express route, you pay only that Park and Ride or express

fare to obtain a transfer for the Bay Area Park and Ride. Transfers are free.

If your originating route to downtown is a local route, you must pay the difference between the local 85-cent fare and the express \$1.20 fare and obtain a transfer to board the Bay Area Park and Ride.

Check a bus schedule, available at the JSC Exchange Store, for fares.

All-day service is available at the Bay Area Park and Ride, but it is provided with two different vehicles. The morning and afternoon peak service is a contract service to Metro and the buses do

not have fare boxes. Therefore, you will need a pass or ticket. The midday service is a Metro bus and does have a fare box, so cash is accepted.

Riders may use the express fare until 3 p.m. from downtown to NASA. Riders commuting into downtown from NASA may use the express fare beginning at 9 a.m. The Park and Ride service operates Monday through Friday only.

If you live in Clear Lake and want to ride the Bay Area Park and Ride route to JSC, the fare is \$1.20 each way and you will need a ticket.

Control Data buys Barrios

Houston's Barrios Technology Inc. and Control Data Corp. of Minneapolis announced Tuesday that they have completed negotiations that will make Barrios a wholly owned subsidiary of CDC's Government Systems Group.

The terms for the acquisition of Barrios, a privately held company that provides information services and systems integration to JSC and its contractors, were not disclosed.

Barrios will become part of CDC's Government Systems business that traditionally has focused on electronic information systems for defense and aerospace markets.

George H. Hubbs, vice president of Advanced Systems for Control Data's Government Systems Group, will take over as Barrios' chief executive officer.

H. Ray Barrett, who has resigned as Barrios' chief executive officer, will act as a consultant to ease the changeover. Barrett led an investor group that bought Barrios in May 1990 from founder Emyre Robinson, who had built one of the country's largest Hispanic-owned businesses. Robinson is expected to stay on as director of public relations.

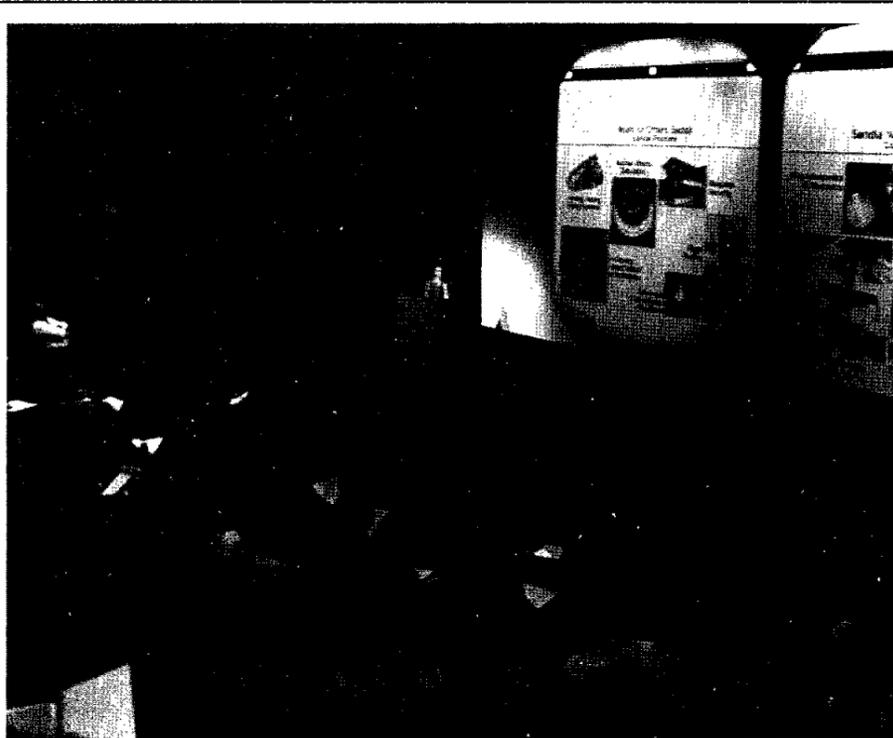
Barrios will retain its identity in the marketplace, and contractual relationships with customers will remain unchanged. No changes in employment or operations are expected.

Workforce steady

(Continued from Page 1)

roughly half a billion dollars by fiscal year 1996. All NASA centers that spend money on the shuttle are affected, Nicholson said.

Newly appointed Kennedy Space Center Director Robert Crippen told KSC workers Monday that the Florida center will be gearing up for *Freedom's* launch at the same time as it absorbs the reduced shuttle spending. "We need to increase the number of employees we have working on processing and getting *Freedom* ready to fly here at KSC," Crippen said. "Consequently, I don't see a significant change in the total manpower here."



JSC Photo by Jack Jacob

Participants listen carefully to one of the presenters at this week's second Space Exploration Technical Interchange in the University of Houston-Clear Lake auditorium.

More than 250 experts gather

Second SEI interchange fruitful

By Kari Fluegel

More than 250 experts on space exploration gathered at the University of Houston-Clear Lake this week for the second Space Exploration Initiative Technical Interchange.

The interchange, held Tuesday and Wednesday, drew participants from 80 organizations around the country for a discussion of current work and research relating to SEI.

SEI is the cooperative effort between NASA, the Department of Energy, Department of Defense and numerous universities and laboratories to establish a lunar base and begin missions to Mars.

"The interchange is an opportunity for us to spread the word on what work we've got going on," said Doug Cooke, manager of JSC's Exploration Programs Office. "We

also give others an opportunity to present the work they've been doing in similar areas. It's communication between NASA and the community interested in SEI."

As part of the interchange, Dave Weaver and Kent Johnson, both of the Exploration Program Office, discussed the reference mission that places a primary emphasis on returning to the Moon and establishing the first lunar outpost.

The reference mission focuses on what technologies and strategies are needed to get the SEI off the ground, Cooke said.

Also during the meeting, several unmanned projects were discussed such as the common lunar lander and a lunar resource mapper.

Overall, Cooke said the meeting was a success. Similar technical interchanges will be conducted quarterly.

Castner subsystem manager of year for Orbiter, GFE office

Bud Castner, chief of the Metallic Materials Section in the Structures and Mechanic Division, was named Subsystem Manager of the Year for 1991 at the Orbiter and GFE Projects Office's first annual awards social.

"We have about 80 subsystem managers in the Engineering and Space and Life Sciences Directorates, and they are really the cornerstone of our engineering activity in the orbiter project. We rely on them to be the brain trust of the orbiter systems," said Orbiter and GFE Projects Office Manager Dan Germany.

Castner is responsible for orbiter materials and processes.

"There are many times where Bud has gone above and beyond the call of duty in helping find a solution to problems that have come up, among them work on the external tank door mechanism cracks, the APU gas generator valve module seat cracks and numerous weld problems. He's a self-starter who is always part of the solution and not part of the problem."

Other honorees included employees of the year John Crockett from the Orbiter Engineering Office; Bobbie Swan from the Flight Data and Evaluation Office; Gerald Reuter from the Orbiter Avionics Systems Office; William Arceneaux from the JSC Resident Office at KSC; Ralph Anderson from the Flight Support Equipment Office; Sidney Schmidt from the Orbiter and GFE Projects Control Office; and Scott McClay from the Orbiter Projects Resident Office at Downey.

The awards social held Dec. 11, at the Gilruth Center recognized outstanding employees in the orbiter project and the contributions of subsystem managers.



Castner

Turner to give keynote for Martin Luther King event

State Representative and former Houston mayoral candidate Sylvester Turner will be the keynote speaker during the Jan. 15 Martin Luther King Birthday Celebration at JSC.

The event, sponsored by the JSC Black Cultural Association, will be conducted in the Gilruth Center Grand Ballroom from 11 a.m. to 1 p.m. It will also include the presentation of the Ron McNair Scholarship by Cleo Glenn Johnson, president of the the Black United Fund of Texas.

Curtis Franklin, an Egyptologist and lecturer, also will participate in the question-and-answer session.

For more information call Charles Hoskins, JSC's Black Program manager, at x34831.

Roles, missions assignments 'fit perfectly' with new JSC strategic plan

(Continued from Page 1)

rol and sustaining engineering on the shuttle."

In the technology and development arena, JSC will become the center of excellence for manned space operations; extraterrestrial outposts and bases, infrastructure and distributed systems; piloted spacecraft and small chemical space propulsion systems.

In the science arena, JSC will become the center of excellence for life sciences research involving human physiology and operational and clinical medicine, and solar system exploration involving meteoric and surface sample analysis. JSC also will play a supporting role in microgravity sciences.

"All of these changes fit perfectly with the new JSC strategic plan that I'll be approving later this month," Cohen said. "Months of detailed study by our best people have pointed us in the same direction, so I am gratified that Admiral Truly agrees with our findings. This reaffirms our center's position in the agency and provides new opportunities for growth."

Under Truly's new lead center plan, the top two levels of shuttle management are being consolidated into a simplified structure at KSC

through a four-step transition that began Jan. 1 and will take about a year to fully implement.

The second step will be an assessment of the preferred locations for elements of the Level III project offices; the assessment will begin April 1 with an implementation plan due by July 1. The third step will be to consider consolidation and cost-saving on program engineering; Nicholson will begin that study by May 1 and have a detailed implementation plan by Sept. 1. The fourth step, an assessment of contractor work assignments at KSC, will begin about Jan. 1, 1993.

Space station program management won't change until after completion of the man-tended critical design review in mid-1993. After that, NASA will focus station management at JSC and Marshall Space Flight Center, with the Level I office at Headquarters and the Level II office at Reston, Va., being consolidated. A plan for the transition is due by December 1992.

Other lead center assignments include Goddard Space Flight Center, Earth science; NASA's Jet Propulsion Laboratory, planetary science; Langley Research Center, National Aerospace Plane; and MSFC,

National Launch System and Space Station *Freedom's* permanently manned phase.

Technology and development centers of excellence will include Ames Research Center, computational aerodynamics and flight testing and computational/numerical simulation; Goddard Space Flight Center, tracking and data systems and Earth observing science spacecraft; JPL, advanced robotics technology, deep space network and planetary science spacecraft; KSC, launch vehicle operations; LaRC, airframe aerodynamics and structures and advanced conceptual space system design independent assessments; Lewis Research Center, aeronautics propulsion, nuclear space propulsion systems, electric space propulsion systems, space power and space communications technology; MSFC, large chemical/solid space propulsion systems, launch vehicle and upper stage development; laboratory science (integration, manned space operations) and pressurized habitats and laboratories for extraterrestrial outposts/bases; and Stennis Space Center, large space propulsion system testing.

Cohen noted that the decision to

put JPL in charge of advanced robotics carries two caveats. First, JSC and other centers will retain roles in the development of robotics applications to meet mission responsibilities. Next, infrastructure and distributed system work for extraterrestrial outposts will be focused at JSC.

Work on the advanced cryogenic engine will be shifted from LeRC to MSFC, SSC's role will be expanded to manage and execute engine test programs defined by the development center with an implementation plan ready by Feb. 15, LeRC will lead the way in space power and communication technology starting with fiscal 1993, and work with pressurized habitats and laboratories will be focused at MSFC.

Science centers of excellence will include ARC, life sciences (gravitational biology, closed environment life support systems, exobiology); GSFC, astronomy and astrophysics (visible, ultraviolet and infrared astronomy and high-energy astrophysics), Earth sciences (global climate change) and space physics (magnetospheric physics, space plasma physics); JPL, astronomy and astrophysics (radio, sub-mm and infrared astronomy, relativity, gravity), Earth sciences (remote

sensing), solar system exploration (planetary sciences) and space physics (heliospheric physics); LeRC, microgravity sciences (fluid physics, combustion science); and MSFC, microgravity sciences (materials science, protein crystal growth), space physics (solar physics).

At MSFC, solar system exploration work will be phased out by Dec. 31. At KSC, life sciences will be phased out by Oct. 1, with the exception of key people and facilities needed to support life sciences data collection before and after shuttle flights and preflight preparation for life sciences experiments. At JPL, life sciences activities will be phased out by Oct. 1. At LaRC, solar system exploration work will be phased out when the current assignment expires, except for comparative research that enhances studies of the Earth's atmosphere. LaRC's microgravity science work also will be phased out by Oct. 1, except for a flight experiment planned for USMP-3 and on-going engineering work. At ARC, space physics will be phased out as soon as the deep space probes are no longer accessible, about 1994. At SSC, Earth and life sciences work will be phased out by Oct. 1.