

### See ma'am?

Two recent milestones bring the first flight of the Commercial Middeck Augmentation Module a bit closer. Story on Page 3.



### Planetary posters

The poster displays at the 23rd annual Lunar and Planetary Science Conference draw interest at the Gilruth Center. Photo on Page 4.

# Space News Roundup

Vol. 31

March 20, 1992

No. 12

## White House announces new exploration strategy

*Exploration programs chief says directive will help NASA get job done*

By Kelly Humphries

The head of the Exploration Programs Office said this week that the Bush administration's new Space Exploration Initiative strategy has a number of advantages, but that the directive's full implications aren't yet fully understood.

Doug Cooke, who heads the office at JSC that is working on near-term precursor missions, strategies for developing lunar bases and sending humans to Mars as well as long-lead technologies, said the biggest

pluses are its reaffirmation of White House support for the Space Exploration Initiative and its call for support from other agencies.

"From an overall stand point, it's helpful and it points in the right direction," Cooke said. "The intent of the entire policy is to be supportive of SEI and that is very positive. All I know is we've got a lot of work to do and this will help us get it done."

The policy statement, issued last

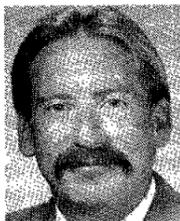
Friday by Vice President Dan Quayle, establishes an exploration office headed by NASA Associate Administrator for Exploration Mike Griffin and staffed by NASA and other agencies.

It also calls for the formation of a steering committee that will be a senior interagency forum for coordinating SEI-related activities and for identifying issues that need to be reviewed by the National Space

Council, headed by Quayle.

The strategy appoints NASA as the principal implementing agency for SEI, and approves major roles for the Department of Defense, the Department of Energy and other federal agencies. It directs the associate administrator for exploration to prepare an annual status report, and for the NASA Administrator to present the report to the National Space Council.

"I think it is enabling in that we're now being Please see **NEW**, Page 4



Cooke

## Budget shortfall may cut hiring at JSC in 1993

By Kelly Humphries

JSC's 1993 budget for civil service salaries may force reductions in hiring and cuts in other related areas, JSC's Human Resources director said this week.

Harvey Hartman, who is responsible for administering the care and feeding of JSC's 3,800 civil service workers, said the squeeze is not expected to force any layoffs at JSC but that it will mean significant belt-tightening in the areas of hiring, training and pay reform programs.

Hartman cautioned that the outlook is based on Congress approving President Bush's NASA budget request as submitted and on NASA Headquarters' plan for allocating the agency's appropriation to its field centers, either or both of which probably will change before the fiscal '93 budget goes into effect on Oct. 1, 1992.

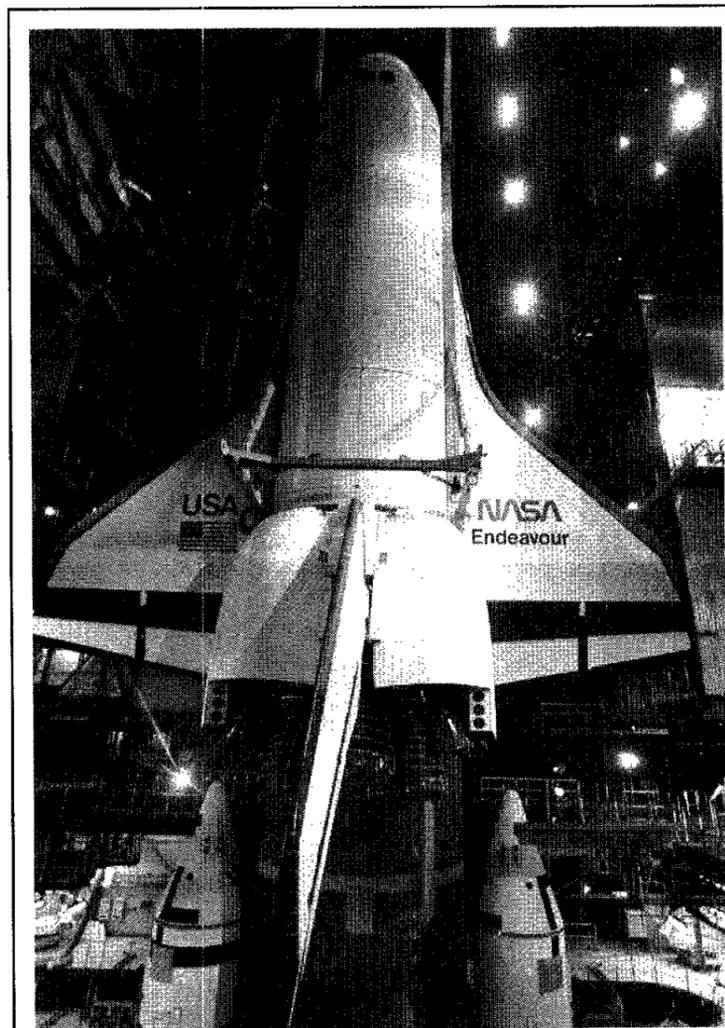
JSC received a fiscal 1993 budget mark from Headquarters during the recent Program Operating Plan 92-1 exercise that was \$6 million short of what JSC will need in Fund Source 1, which covers all personnel-related costs including salaries, overtime, training awards and merit pay.

JSC estimates it will need \$251.5 million in fiscal '93, but the early estimate of what the center will receive is only \$245.4 million.

"Of the \$251 million, almost \$230 Please see **HUMAN**, Page 4



Hartman



NASA Photo

**WORTHY ENDEAVOUR**—*Endeavour*, NASA's newest space shuttle orbiter, is lowered to join its STS-49 external tank and solid rocket boosters in the Vehicle Assembly Bldg. at Kennedy Space Center. Following the stacking operation, *Endeavour* was rolled out to Launch Pad 39B, where it is being prepared for a 20-second main engine firing test early next month. *Endeavour's* first flight will be the *Intelsat VI* rescue and Assembly of Space Station by EVA Methods mission, featuring space walks on three consecutive days, in early May.

## Countdown clock ticking for *Atlantis*

By James Hartsfield

The countdown clock for *Atlantis* is set to begin ticking at 11 a.m. CST today toward a 7:01 a.m. CST Monday liftoff on STS-45, carrying the first Atmospheric Laboratory for Applications and Science.

The STS-45 crew — Commander Charles Bolden; Pilot Brian Duffy; Mission Specialists Kathy Sullivan, David Leestma and Mike Foale; and Payload Specialists Dirk Frimout and Byron Lichtenberg — will leave for KSC today, arriving in Florida at about 5:30 p.m. CST.

At Pad 39A, technicians this week closed out the engine compartment for flight, stowed final crew equipment onboard, installed the crew escape pole, closed the payload bay doors for flight, topped off the ATLAS-1 payload with freon and performed a final purge of the external fuel tank.

ATLAS-1 is the first in a series of shuttle missions that will enable detailed studies of one part of the complex system that supports life on this planet — the atmosphere.

Yearly ATLAS missions are part of Phase I of NASA's Mission to Planet Earth, a large-scale, unified study of planet Earth as a single, dynamic system throughout one solar cycle, which lasts 11 years.

Throughout the ATLAS series, scientists will gather new informa-

tion to gain a better understanding of how the atmosphere reacts to natural and human-induced atmospheric changes. That knowledge will help us identify measures that will keep Earth suitable for life for future generations.

ATLAS-1 will carry 14 experiments to investigate the interactions of the Earth's atmosphere and the Sun. The experiments will study the chemistry, physics and movement of the middle and upper atmosphere by measuring the Sun's energy.

They also will observe the links between magnetic fields and electrified gases, called plasma, that lie between the sun and Earth. By studying these factors throughout a solar cycle, scientists will be able to form a more detailed picture of Earth's atmosphere and its response to changes in the Sun.

Also, an astronomical telescope will examine sources of ultraviolet radiation in the Milky Way and other galaxies to learn more about the stages in the life of a star.

With an on-time launch, *Atlantis* is planned to land at KSC's Runway 15 Shuttle Landing Facility at 5:08 a.m. CST March 31.

Just over 8,000 feet away from *Atlantis*, preparations of *Endeavour* for an engine test-firing planned April Please see **ENDEAVOUR**, Page 4



## Four 1993 shuttle flights receive crew assignments

By Barbara Schwartz

Crew members for four 1993 space shuttle missions were assigned Monday.

Frank L. Culbertson Jr., a U.S. Navy captain, will command STS-51 scheduled for early 1993. Culbertson and his crew will deploy the Advanced Communications Technology Satellite and the German-developed Astronomy Telescope-Shuttle Pallet Satellite. ACTS, propelled by a Transfer Orbit Stage booster to geosynchronous orbit, will test technology for future communications systems. ASTRO/SPAS will carry the Orfeus telescope to study radiation absorbing material in the solar system.

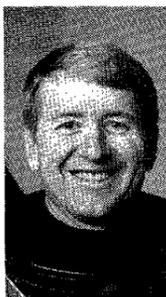
Other STS-51 crew members will be William F. Readdy, pilot; Navy Lt. Cdr. Daniel W. Bursch, mission specialist; James H. Newman, Ph.D.,

mission specialist; and Air Force Maj. Carl E. Walz, mission specialist.

Culbertson was the plot on STS-38, a Department of Defense mission in November 1990. Readdy was a mission specialist and orbit pilot on STS-42 in Jan. 1992, during which 55 scientific experiments were performed aboard the International Microgravity Laboratory-1. Bursch, Newman and Walz will be making their first flights.

Kenneth Cameron, a colonel in the U.S. Marine Corps, will command STS-56, also scheduled for early 1993. STS-56 is the second Atmospheric Laboratory for Applications and Science mission. Additionally, Cameron and his crew will deploy and retrieve the Spartan 201 satellite that will study the physics of solar-wind acceleration.

Please see **ASTRONAUTS**, Page 4



Culbertson



Cameron



Readdy



Bursch

## Brand to direct planning for National Aero-Space Plane

By Barbara Schwartz

Veteran astronaut Vance Brand, commander of three space shuttle missions, has accepted a new position as director of plans for the X-30 National Aero-Space Plane Joint Program Office at Wright-Patterson Air Force Base, Dayton, Ohio, effective immediately.

Brand will develop program plans and objectives to meet the national goals proposed for the NASP effort and will assess the program to make sure individual technologies are fully integrated into the X-30. The X-30 is a flight research vehicle that will take off horizontally, fly into orbit, using air breathing engines as its primary propulsion,

then return through the atmosphere to land on a runway.

While at JSC, Brand logged 746 hours in space on four flights including the Apollo-Soyuz mission in July 1975 and three shuttle missions — STS-5 in November 1982, STS-41B in February 1984 and STS-35 in December 1990.

Selected as an astronaut in April 1966, Brand has applied his engineering expertise to numerous ground and flight test projects. In the Astronaut

Office, he has held the positions of chief of the Operations Development Branch and chief of the Safety Branch. He also served as assistant project manager for integration and Please see **BRAND**, Page 4



Brand

JSC

# Ticket Window

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

EAA Bluebonnet Trip (April 4 and 11, bus leaves from Bldg. 25 parking lot at 7:30 a.m., returns 5:30 p.m.): \$22 per person.

EAA Walt Disney on Ice (noon March 28, Summit): \$8.

EAA NASA Night at Astroworld (6 p.m.-midnight, April 24): first 5,000, \$8.50; rest \$10.50. Limit 8.

EAA Astros vs. Atlanta Braves (7:35 p.m. April 7, Astrodome): \$8.

Sea World, \$18.90; Astroworld, \$16.95; Waterworld, \$9.50; and Six Flags, \$14.95. Movie discounts: General Cinema, \$4; AMC Theater, \$3.75; Loews Theater, \$4.

The following discount tickets will be available soon:

EAA Easter Egg Hunt, April 11.

EAA Country Western Dance, April 18

EAA Astroworld Night, April 28

EAA JSC Picnic, May 2.

EAA 1992 Tour of World Figure Skating Champions, June 4.

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# Gilruth Center News

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

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

**Weight Safety** — Required course for employees wishing to use the Gilruth weight room. The next class will be from 8-9:30 p.m. March 31. Cost is \$5.

**Defensive driving** — Course is offered from 8 a.m.-5 p.m. and April 18. Cost is \$19.

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

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

**Scuba** — Scuba classes will meet at 6:30 p.m. Tuesdays and Thursdays beginning April 9. Cost is \$190 plus \$20 for the open water dive trip. Personal equipment costs about \$90.

**Volleyball workshop** — Eight-week program will meet Saturdays beginning March 21. Open beginner classes will meet from noon-2 p.m. Mixed advanced classes will meet from 2-4 p.m. Enrollment is limited to 24 students. Cost is \$25.

**Softball managers meeting** — Managers of all spring softball teams will meet at 5:30 p.m. March 23 in Rms. 216-218 of the Gilruth.

**Softball tournament** — Men's pre-season open "C" softball tournament will be April 4-5. Entry deadline is 7:30 p.m. April 2; cost is \$95 per team.

**Intercenter run** — Runners in the 10-kilometer or 2-mile races may turn in their times for the annual Intercenter Run at the Rec Center throughout April.

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

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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: Friendswood, 2 lots, 0.95 acre, all util, \$25K/\$29K or \$39K/both. Ron, 996-9724.

Lease: University Place, 2-2, \$850/mo. Dave, x38156 or Herb, x38161.

Sale: Meadowgreen, 3-2-2, near tennis courts/pool, open house Sunday, March 29th, 1 p.m. to 4 p.m., \$99K. 480-3085.

Lease: University Trace condo, 2-2, FPL, WD, 2nd floor, \$525/mo. Ronny, 480-1861.

Sale: 3-2-2, fenced, brick, eat-in kitchen, FPL, DR. 333-9733.

Sale: Pearland, Dixie Hollow Subdivision lot, all util, x39530 or 482-5003.

Sale: Heritage Park, 3-2-2, cul-de-sac, new kitchen ceramic tile, fans, alarm, \$76.5K. 283-4491 or 996-9396.

Sale: Friendswood, 3-2-2, 2 living areas, DR, lg master BR, parquet entry, wood deck, fenced, \$63.5K. 482-6651.

Sale: Sage Glen, 4-2-2, formal LR/DR, jacuzzi w/deck, 2300 sq ft, \$89.5K. x31413.

Sale: Lazy Bend, 3-2, Italian tile in LR, DR, kitchen, carpet in BRs and hall 1 yr old, 1800 sq ft, \$160K. 538-3434.

Lease: Seabrook, multi-level, waterview, FPL, jacuzzi, decks, room for boat on 3 car drive, \$850/mo plus \$850 dep. 333-6821 or 474-9155.

Sale: Santa Fe, 2.5 acres, well, septic, fenced, \$21.9K, no owner financing. 534-2231.

Lease: University Trace condo, 1 BR, 832 sq ft, upstairs/downstairs, FPL, \$450/mo, avail Apr 1st. 286-1934.

Rent: Middlebrook, 4-2-2, \$800/mo. 283-4806 or 486-5380.

Sale: Shoreacres, 2 lots, \$3.2K/ea OBO for both. Frank, x34185.

Sale: Bacliff, 3-1 single wide mobile home on 100 x 125 lot, incl 20 x 30 warehouse, partially wood fenced, mobile home has 8' ceilings, new A/C and heat, room for additional mobile homes, \$20K OBO. 339-1337.

## Cars & Trucks

'88 Chevy Silverado, AM/FM/cass, custom int/ext, loaded, low mi, \$9K OBO; '74 CJ5 Oklahoma Jeep w/no salt damage, good cond, \$4K OBO. 489-7286.

'90 Dodge Dakota convert, alarm sys, rust protect, serv contr, all pwr, 13K mi, ex cond, \$13.5K OBO. 244-9744 or 333-9742.

'52 Chevy PU, \$1.9K OBO. 534-6750.

'79 Jeep CJ7, V-8, new tires, tilt, cruise, Bikini top, 65K mi, good cond, \$3250. Rich, x34818 or 480-8335.

'73 Mercedes 450SL, both tops, all pwr, A/C, spd ctrl, ex cond, \$10.5K. 488-8493.

'90 Pontiac Lemans, A/C, tape, new car warr, silver, 13K mi, ex cond, \$6K. x31354 or 946-3809.

'84 Cadillac Sedan Deville, gray w/maroon velour int, 73K mi, good cond, \$3.5K. Don, x37319.

'88 Acura Integra, special edition, blk/gold, pwr sunroof, AM/FM/cass w/equalizer, tinted, ex cond, \$9.4K. 244-5887 or 286-5943.

'91 Ford Ranger PU, XLT, P/S, P/B, 5 spd OD, A/C, sliding rear window, in-bed util box, line-a-bed,

tinted glass, custom wheels and striping, approx 9K mi, \$9K. Bob, 338-9919.

'85 VW Golf, 75K mi, stereo, A/C, sunroof; '82 Vanagon L camper, rebuilt, remodeled, 10K new mi, \$7.8K. Mike, 283-5890 or 868-5132.

'72 Pontiac Ventura, 4 dr, good cond, \$400 OBO. 283-5514.

'83 Jaguar XJS, burg w/tan int, 60K mi, ex cond, \$8750. 992-2587.

'91 GMC Jimmy S-15 SLE, 2 dr, custom mags, alarm, loaded, ex cond, \$13.5K OBO. Chris, 280-1932 or 337-5410.

'79 MG Midget, AM/FM/cass, new tires/batt, 51K mi, was \$4300, now \$3900. Steve, 280-1685 or 486-6741.

'87 Chevy Astro van, CL pkg, V-6, 4.3L, loaded, factory mags, 2 tone paint, tinted windows, repair manuals, \$7.5K. x38785 or (409) 945-8787.

'83 Mazda RX7 GSL, leather, beige maroon, new paint, loaded, ex cond, \$2.9K. 790-4671 or 472-7059.

'84 Honda Civic, 4 dr, burgundy ext/int, AM/FM/cass, 115K mi, \$2K OBO. Eric, 335-2369 or 481-5906.

'86 Hyundai Excel, 4 dr, 5 spd, A/C, blue, 92K mi, good cond, oil leak, \$1.1K; '86 Subaru GL, 4 dr, auto, A/C, blk, 112K mi, good cond, \$2.7K. Larry, x34527.

'87 Suzuki Samurai, 4x4, 5 spd, A/C, stereo, 70K mi, \$3.5K OBO; '84 Honda Accord, 2 dr, 5 spd, cruise, A/C, stereo, 140K mi, good cond, \$2.9K OBO. 333-6509 or 486-1750.

'84 Bronco II XLT, 4x4, 5 spd, good cond, \$3.9K. Scott, x34614 or 334-2278.

## Boats & Planes

19' boat trlr, 2.5K lbs, \$450. 534-2179.

19' Hollywood trihull boat, Johnson 85hp, trlr, \$1250. Wayne, 282-3118.

'82 Citation 17' boat, v-hull, 125hp Volvo I/O, new int, newly painted trlr, boat in ex cond, \$4.9K OBO. Monte, 326-3101.

'88 Kawasaki 440 jet skis (2), ex cond, '84 Kawasaki 440 modified, plus trlr, \$3K. Tom x35457 or 488-1191.

'83 Skiffish, 16', 1150B, trolling motor, depth finder, galv trlr, casting chairs, live wells, \$3990. x31497 or 554-4215.

'76 Catalina, 27' sailboat, 3 sails, I/B diesel, Bimini wheel, updated int, 2 batt, depth and knot meter, \$12.9K OBO. Ken, x30921 or 554-6504.

VIP 15' bass boat, 50hp Johnson and trolling motor, depth finder, 2 fishing chairs, trlr, \$1.5K. x36171.

Glastron 17' bass boat w/115hp Johnson, depth finder, bait wells, trolling motor, complete w/trlr, \$2.5K. 470-0718 or 946-2939.

'74 Tri-hull 17' boat, walk thru windshield, 115hp Evinrude, 40mph, trlr, \$1250. Mark, x36193 or 480-8918.

Hobie 16, multi-colored sails, blk anodized alum frame, double trapeze, righting sys, galv trlr w/custom cat box, 2 harnesses, 4 life vests, \$1.2K OBO. Carla, x32959 or 992-4137.

## Cycles

'78 Honda CB 750K motorcycle, good cond, does not run, many new parts, \$400. 488-2960.

Boys 22" Schwinn bike, ex cond, \$75. 996-9157.

Mens 10 spd Schwinn bike, good cond, \$50. Teresa, 480-4101.

Ladies 26" Huffly 3 spd bike, \$55; girls 20" Western Flyer bike, \$30. David, x36090.

Boys 10 spd Raleigh touring bike, was \$350, now \$50. 488-2960.

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# Dates & Data

## Today

**Women's history** — JSC's Federal Women's Program will continue its observance of Women's History month at 11 a.m. March 20 in Bldg. 1, Rm. 602C. Dr. Angela Howard Zophy, associate professor of history at the University of Houston-Clear Lake, will discuss "Consciousness Raising and the Women's Liberation Movement, 1968-1972." For more information, call FWP Manager Pam Adams at x33761.

**UNIX meeting** — The JSC UNIX Systems Administration Group will meet at 2 p.m. March 20 in Bldg. 12, Rm. 256. Michael Heidt will discuss "Setting Up USENET Newsfeeds." For more information, call Mark Hutchison, x31141.

**Abstracts due** — The deadline for abstracts for the 17th annual Technical Symposium co-hosted by the Houston Section of the American Institute of Aeronautics and Astronautics and the University of Houston-Clear Lake's High Technologies Laboratory is March 20. Abstracts of 250 words or less should be submitted with a completed NASA Form FF427 to Bill Best, AIAA vice-chair, technical, RSOC/R12A-130, 600 Gemini, Houston, 77058. For more information, call Best at 283-0261.

**Cafeteria menu** — Special: Salisbury steak. Entrees: fried shrimp, deviled crabs, ham steak. Soup: seafood gumbo. Vegetables: buttered carrots, green beans, June peas.

## Monday

**Cafeteria menu** — Special: hamburger steak. Entrees: beef Burgundy over noodles, fried chicken. Soup: cream of chicken. Vegetables: but-

tered corn, carrots, green beans.

## Tuesday

**Picnic committee meets** — The 1992 JSC Picnic Committee will meet at 4:30 p.m. Feb. 18 at the Gilruth Center. For more information, call Ginger Gibson, x30596.

**Cafeteria menu** — Special: turkey and dressing. Entrees: baked meatloaf, liver and onions, barbecue spare ribs. Soup: beef noodles. Vegetables: Spanish rice, broccoli, buttered squash.

## Wednesday

**NMA meets** — The JSC chapter of the National Management Association will meet at 5 p.m. March 25 at the Gilruth Center. JSC Human Resources Director Harvey Hartman will present "Current Human Resource Issues at JSC." Cost is \$8 for guests. For more information, call Valerie Burnham, x34210.

**Science programs** — The American Institute of Aeronautics and Astronautics will and the Institute of Electrical and Electronics Engineers will present a seminar on "Programs in the School of Natural and Applied Science at UH-Clear Lake" at 10:30 a.m. March 25 at the Gilruth Center. For reservations, call Frankie Hap at 333-6064.

**BANN meets** — The Bay Area NAFE (National Association of Female Executives) Network will meet at 11:30 a.m. March 25 at South Shore Harbour Country Club. Dr. Jeffrey Ross, podiatry and sports medicine specialist, will discuss "The Highs and Lows of Hi-Heels." For more information, call Sharon Westerman, 486-8927.

**Cafeteria menu** — Special:

Spanish macaroni. Entrees: broiled fish, tamales with chili. Soup: seafood gumbo. Vegetables: ranch beans, beets, parsley potatoes.

## Thursday

**Women's history** — JSC's Federal Women's Program will continue its observance of Women's History month at 1 p.m. March 26 in Teague Auditorium. A panel discussion on "How to Be Successful" will feature Ninfa Laurenzo of Rio Star Corp., Dr. Roger Blakeney of the University of Houston; Shelly Tulloch of TNT Consulting, Jim McIngvale of Gallery Furniture, Judge Patricia Lykos and NASA Assistant Administrator for Equal Opportunity Programs Harriett Jenkins. For more information, call FWP Program Manager Pam Adams at x33761.

**IEEE videoconference** — The International Electrical and Electronics Engineers Galveston Bay Section will present a videoconference on "Making High Performance Optoelectronic Data Communications Work" at 11 a.m. March 26. Registration deadline is March 20; call Andy Lindberg, x31474. Cost is \$50 for members, \$15 for student members.

**Cafeteria menu** — Special: chicken fried steak. Entrees: beef pot roast, shrimp chop suey, pork chops. Soup: navy bean soup. Vegetables: carrots, cabbage, green beans.

## March 27

**Cafeteria menu** — Special: tuna and noodle casserole. Entrees: broiled codfish, fried shrimp, baked ham. Soup: seafood gumbo. Vegetables: corn, turnip greens, stewed tomatoes.

# Swap Shop

## Audiovisual & Computers

Sony CD player, 1 yr old, ex cond, \$125 OBO. Helen, x38413 or 554-2728.

STS 251 HD, 42 MB, 28 NS w/16 bit controller, good cond, \$150. 339-1337.

Mac Plus 1024K, dual 800K DD, surge protector, Imagewriter prtr, SW, \$650. Rod, x31465 or 991-3965.

DR DOS 6.0, orig prog disk and manual, was \$75, now \$40. x37137 or 482-8966.

Sherwood S1170 AM/FM/stereo receiver, 17 watts RMS per channel, \$35. 333-2830.

Apple IIe computer, 12K RAM, mono moni, 2 FD, SER/PAR I/O card, SW, books, \$300. 484-4465.

Macintosh 512K, Imagewriter I prtr, mouse, kybd, ex cond, \$550, all or part. Mary, 333-7465.

Commodore 64, color moni, DD, prtr, joysticks, SW, \$295; IBM monochrome moni, \$45; CGAMDA, video card, \$10; MDA video card, \$8. Gary, 283-5724.

Microsoft Flight Simulator v1.02, orig program disk and manual, runs on Mac Plus and Mac SE, \$10. 488-5522.

IBM PC Junior w/color moni, \$300. 482-9566.

Amiga 2000 w/video toaster, 6 MB RAM, 120 MB HD, 25 MHz accelerator, paint and comm SW, heart of digital video editing and SFX facility. Mark Areno, 283-1933 or 529-6542.

## Photographic

Canon A-1 SLR w/50mm and 28mm lenses, Canon Speedlite 155A flash, Lowe-Pro padded case, \$200. Wayne, x34437.

## Pets/Livestock

Free 3 yr old Vizsla. Mark, x38013 or 992-4132. Baby cockatiels, hand-fed, many colors. Linda, 484-7834.

## Household

Sony Trinitron 15" color TV, \$50. 488-2960. Early American qn sz sleeper sofa in fall colors, ex cond, \$150; 2 rust colored swivel rockers, good cond, \$30/ea or \$50/both. 992-3876.

Maytag elec dryer, \$50. John, 280-2133 or Teresa, 244-5212.

Solid oak desk and chair, \$200; light oak breakfast table w/4 chairs, \$250; 2 tier glass and brass serving cart, \$50; cloth love seat, beige w/fg floral print, \$175; new 1990 Voit air bike w/digital read-out, \$200. 335-2749 or 334-5291.

Custom-made drapes, beige, incl 2 patio sz, 75" x 82", 2 window sz, 36" x 72" w/matching valances and all hardware. Billie, x34641 or 333-3425.

Kenmore W/D, wht, 2 mo old, was \$893.80, now \$700 OBO. Larry, x30428 or 326-1159.

Country French china buffet, light finish, no flaws, orig glass, ex cond, \$300; rattan LR set, sofa, swivel rocking chair, coffee table, open wall unit, ex cond, \$300. 992-5745.

Oak kg sz waterbed w/padded side rails, heater, new liner, \$80 OBO. x31913 or 486-9488.

Flexsteel qn sz sofa bed, beige, good cond, \$200. Laura, x37284 or 488-0876.

Grundig stereo console, \$175; Early American DR table w/6 chairs, \$250. 532-2228.

Queen Anne DR table w/4 chairs, \$350. Wayne, x34437.

Couch, love seat, beige floral, 4 yrs old, good cond, \$300/both. 482-9566.

Small GE elec dryer, ex cond, \$75. 333-9246.

Used carpet w/pad, 14' x 18", neutral color, ex cond, \$3.50/yd; blk lacquer oriental furniture, buffet/bar w/oyster shell inlaid and sculptured figures, \$700; hand painted curio cabinet, \$280; sofa table,

\$250; set of 4 Chinese pictures, \$150, \$1.2K/all. 333-7180 or 333-9581.

Dresser w/mirror and night stand, oak color, \$50; Buescher silver plated flute, \$50. x35785 or 280-8394.

Wood entertain ctr, \$75; TV stand, \$40, both in good cond; AM/FM/cass/phone/8 trk stereo, \$15; manual typewriter, \$10. x34419.

Sofa and love seat, blue/light brwn/off wht, good cond, \$175; Judy Rankin, ladies full set of golf clubs, bag, balls, tees, sz 8 shoes, \$250; '80 Corvette, wht, good cond, needs upholstery, \$7K. 532-2158.

Wicker chair, wht, \$30; stainless steel 6 gal pot w/lid; \$25, new luggage cart, \$10; used alum storm door, 32" x 80", \$25; new kg sz bed frame, \$25; wrought iron furniture, 2 chairs, 1 love seat, 3 tables, 1 dining table, 4 chairs, needs refinishing, \$200; macrame hanging table w/light, \$50. x34741.

King sz waterbed w/baffles, cov frame, blk drws under bed, \$150; designer drapes for waterbed, rust color; contemporary sofa, \$300; 5 sofas, French Prov love seat, \$200, and matching couch, \$250, ex cond, ivory plaid love seat, \$150, and matching couch, \$200. 532-2228.

Sears dishwasher, almond, pwr miser all cycles; Sears heavy duty washer, wht; Sears gas dryer 700, wht, Wards refriger/freezer, wht, needs door gaskets; G.E. elec built-in oven brushed stainless w/chrome; G.E. range-top elec built-in, brushed stainless w/chrome; all in good cond. Moore, 472-4667.

## Lost/Found

Man's silver tie clasp w/silver flower decoration. E. Rubenstein, x34807 or 532-2211.

## Wanted

Want gas edger and fertilizer spreader. Andy, 333-6671 or 332-9105.

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

Want Nikon 8008 auto focus camera, good cond, exposure meters and background equip. J. D. Moore, 943-1952.

Want non-smoking male roommate to share turn/unfurn 2-2 apartment in CLC, \$275 plus 1/2 util. 486-2463.

Want individuals interested in learning Japanese in the CLC area. Chris, 333-6866.

# Space for Lease

## Commercial middeck module provides completely new way of putting experiments on shuttle



By Billie Deason

**T**wo recent milestones brought closer the first flight of the Commercial Middeck Augmentation Module and a completely new way of getting experiment payloads onto shuttle flights.

Those milestones — the arrival of the first flight module at the new SPACEHAB Payload Processing Facility at Cape Canaveral, Fla., on Feb. 12, and the assignment nine days later of Payload Commander G. David Low and Mission Specialist Janice Voss to CMAM's first payload crew — showed steady progress toward STS-57, now slated for summer 1993.

STS-57 is the first of six CMAM missions covered by the 1990 contract with SPACEHAB Inc. The two flight modules will fly about twice a year with a standard complement of 50 middeck locker-equivalents including two rack spaces.

Space in the CMAM is attractive to commercial customers because procedures already are in place to speed their experiments into space. Rather than a three-year integration process like that of more complex Spacelab missions, initial integration into CMAM takes only 18 months. Integration time for reflight experiments can be even less.

The accelerated schedule lets commercial experimenters obtain quicker results on their work, a significant advantage from both a cost and product schedule perspective. Additionally, changes and refinements to both hardware and procedures can be made later in the development process of a product or scientific study.

"We are breaking new ground with this project," said Dan Bland, manager of the CMAM Project Office at JSC. "The JSC Strategic Plan recognized the need at JSC, within NASA and as a nation to stimulate new commercial space ventures. The CMAM Program directly facilitates this objective."

Presidential and congressional directives in 1984 and the 1991 U.S. Commercial Space Policy Guidelines stated that NASA is obliged to "... seek and encourage, to the maximum extent possible, the fullest use of commercial space."

CMAM was designed to do just that.

At 9 feet long and 13.5 feet in diameter, the truncated cylinder occupies about one-fourth of a shuttle payload bay. CMAM connects to the middeck by a modified Spacelab tunnel and can be flown with other major payloads.

The SPACEHAB concept evolved from a

1983 idea developed by entrepreneur Bob Citron. When he approached NASA with the concept for a pressurized module to carry paying passengers into space aboard the shuttle, he discovered the agency's real need was for more experiment payload space within the habitable volume of the orbiter.

By 1985, NASA and SPACEHAB signed a memorandum initiating discussion of technical and administrative issues. In 1986-87, the Phase B engineering study, definition and preliminary design were completed. In response to requirements for additional shuttle middeck volume to accommodate experiments sponsored by NASA's Office of Commercial Programs, a request for proposal solicited competitive bids for the CMAM project in March 1990.

However, SPACEHAB was the only bidder and a contract was awarded in December 1990 using a newly created streamlined acquisition process which served to expedite the end-to-end procurement activity by the JSC Procurement Office.

"The concept of a commercial, entrepreneurial company performing manned space operations capability development, integration and support tasks that have historically been performed by NASA civil servants and support contractors does indeed represent a change in the way we do business," Bland said. "I have been really impressed with the supportive attitudes of the various NASA organizations that continue to assist SPACEHAB Inc., and their contractor, McDonnell Douglas Space Systems Co., in developing the operations concepts and processes required to successfully integrate each CMAM mission."

Although the names CMAM and SPACEHAB are sometimes used interchangeably, in actuality SPACEHAB's module is the design solution to NASA's contract requirements for a CMAM capability to expand the shuttle's middeck cargo capacity.

SPACEHAB Inc. contracted with McDonnell Douglas' Huntsville Space Division to provide the design development, manufacture and physical integration of the CMAM module and its experiment cargo. In addition, McDonnell Douglas provides all users with complete shuttle payload integration, crew-training coordination and real-time mission support services.

As McDonnell continues to develop the CMAM integration processes, JSC's CMAM Project Office consults with SPACEHAB Inc. executives and McDonnell engineers. Since the contract emphasizes systems performance rather than system specifications, the project office also provides routine oversight of module resource capabilities to ensure government requirements are satisfied.

"McDonnell Douglas is doing many things we usually do ourselves. We don't own the hardware and we don't integrate it," Bland said. He added, however, that "McDonnell

Douglas has shown a great willingness to benefit from our 25 years experience developing and integrating various kinds of payloads."

Shuttle middeck payload history shows that after all the essential crew equipment fits into the middeck lockers, only four or five lockers worth of space is available for experiments on a given flight.

Middeck experiment space became even more desirable in the late 1980s when the Office of Commercial Programs began a program of Centers for the Commercial Development of Space, 17 consortia of academic and industrial partners started throughout the country with government seed money. Each CCDS focuses on a research area with potential commercial applications such as crystal growth, materials development, robotics and pharmaceuticals.

Locating these experiments inside a pressurized volume with the crew is an important plus for many CCDS

researchers. During previous shuttle missions, astronauts have been able to make on the spot adjustments or evaluations that enhanced experiment success. Other payloads like Protein Crystal Growth, the Investigation into Polymer Membrane Processing and the Bioserve/ITA Material Dispersion Apparatus all required a crew member to participate in some phase of the experiment procedures.

"Without the additional space CMAM gives us, the backlog buildup of middeck experiments would discourage commercial customers," Bland said.

When the contract was signed with SPACEHAB, the primary requirements for NASA-sponsored module space were from customers represented by NASA's Office of Commercial Programs. However, since the modules have been under construction, other NASA program offices have expressed interest in using the module's capabilities.

NASA's Centers for Commercial Development of Space will use about two-thirds of the total 300 locker-equivalents over six flights. SPACEHAB can lease the remaining third to other commercial customers. On the first two CMAM flights, NASA will take most of the experiment space, then use only about 50 percent of the available space on the next four flights.

"Several of JSC's Space and life Sciences payloads will be on the first CMAM flight," Bland said. "Additionally, the Marshall Space Flight Center is negotiating with SPACEHAB Inc. to fly a prototype of the Space Station Freedom environmental control system hardware on the first SPACEHAB mission."

The SPACEHAB Payload Processing Facility at Port Canaveral is analogous to a combined operations and checkout (O&C) and orbiter processing facility (OPF) used to prepare the shuttle for flight.

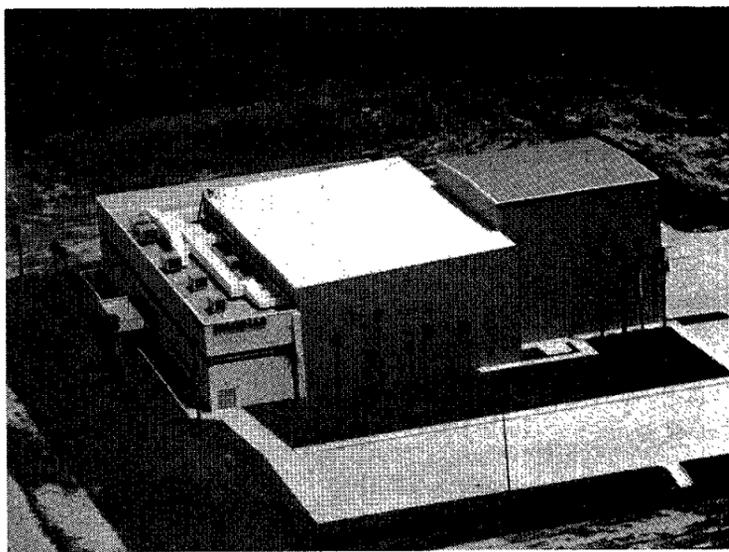
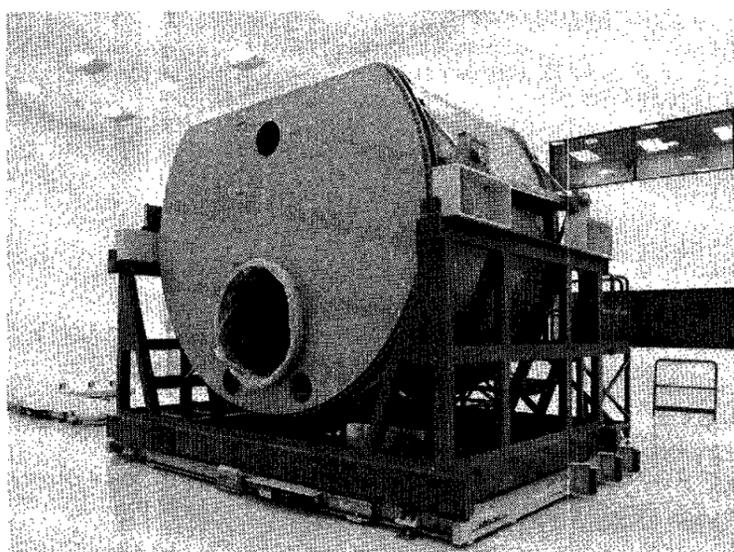
From the SPPF, the fully stowed module for the first flight will be delivered to the O&C building three and a half months before launch. At the O&C facility, cargo integration test equipment is in place to check the physical electrical and mechanical connections between the orbiter and CMAM. About six weeks before launch, the SPACEHAB module is transferred to the OPF for installation into the orbiter cargo bay.

For experiments requiring late access, a limited number can be accepted while the module is on the pad and can be loaded as late as 14 hours prior to launch.

Once the shuttle returns to Earth, critical experiments can be removed before it returns to the Florida processing facility. □

*'The concept of a commercial, entrepreneurial company performing manned space operations capability development, integration and support tasks that have historically been performed by NASA civil servants and support contractors does indeed represent a change in the way we do business.'*

—CMAM Project Manager Dan Bland



**Top:** The Crew Middeck Augmentation Module Project Office team gathers around a model of the SPACEHAB module. Team members are, standing from left to right, Gary Vitemb, Bob Algeier, Ed Riley and Pat Bahr, and seated, Gary Kitmacher and Jerry Lewis. **Bottom left:** The first SPACEHAB module flight unit arrived in the SPACEHAB Payload Processing Facility in February to be readied for STS-57. The module will ride in the orbiter's cargo bay with the entry hatch connected to the crew cabin by a short tunnel. **Bottom right:** The SPPF combines module processing, operations and checkout under one roof.

# New exploration strategy brings added resources

(Continued from Page 1)

supported to go work with other agencies and I think it will give the impetus in those agencies for people to work with us. I think there's a lot we can do with it," Cooke said.

NASA established its Office of Exploration before the policy was issued, and has been pursuing cooperation with other agencies under previous presidential directives on America's space policy. It also has implemented many of the recommendations contained in the reports of the Advisory Committee on the Future of the U.S. Space Program, chaired by Norman Augustine, and

the Synthesis Group, chaired by Gen. Tom Stafford.

"I think we've been moving in this direction, but this defines and reemphasizes the role of the space program through the eyes of the White House," Cooke said. "The policy statement references both the Synthesis Group and Augustine reports."

Of particular importance, Cooke said, is the fact that it lays out the roles of DOD and DOE in support of SEI, and directs them to work through the NASA Office of Exploration.

"It's an added resource, because

there are technologies and capabilities in DOE and DOD, especially technologies, that will help NASA. They have led the way in nuclear technologies, and that was emphasized in the policy statement as well," Cooke said. "It also encourages agencies in addition to DOE and DOD to get involved."

Cooke said the strategy reinforces what was recommended by the Synthesis Group by stressing things like continuing to get innovative ideas from outside the program, focusing research and technology for exploration and for the new National Launch System to be responsive to

SEI requirements.

The strategy also sets out exploration guidelines that provide for critical, long-lead research and development activities; foster private sector investment, ownership and operation of space-related projects that promote U.S. economic competitiveness; incorporate evolutionary plans for a new national launch system; continue space nuclear power and propulsion technology development in a safe and environmentally acceptable manner; call for a definitive life science program in support of lunar and Mars missions; and seek improved and streamlined acquisition

procedures for SEI projects.

Most of the remaining questions involve what role the National Space Council will take as it establishes the interagency steering committee and begins receiving annual status reports, the first of which is due in November, and a Strategic Plan for SEI, which is due in April 1992.

"It establishes a steering committee, which is new," Cooke said. "We don't know the full implications of that yet, but it is at the Space Council level and emphasizes cooperation among agencies. I think that's fine because we need to work together as a national team."

## Systems engineering group sets up Texas chapter in Clear Lake

A Texas chapter of the National Council on Systems Engineering is being established in the Clear Lake area, and the group is looking for help from NASA systems engineering professionals.

One of the goals of the NCoSE is to foster the definition, understanding and practice of world-class systems engineering in industry, academia and government by bringing together experts and challenging them to research, develop and promote advanced systems engineering processes, tools and skills.

NCoSE will host a charter meeting for the Texas chapter March 25 at the University Hilton. A planning session is scheduled for 2 p.m., with a reception to follow at 5:30 p.m. and a dinner program at 7 p.m.

For reservations, call Ed Smith or Shirley Bradberry at 333-6354, or Gerry Moorman or Vera Steed at 333-6422.

## Former astronaut Pogue to autograph new book

Former Skylab astronaut Bill Pogue, author of the popular book "How Do You Go to the Bathroom in Space?" will autograph copies of his new novel, "The Trikon Deception," next week.

Pogue will be at Jeremy's Bookshelf, 2441 Bay Area Blvd., from 4:30-6 p.m. Wednesday.

The novel, written with Ben Bova, president of the Science Fiction Writers of America, is set in space on the first industrial research laboratory orbiting Earth.

## AFCEA meets Thursday

Capt. Tony Alejandro of the U.S. Coast Guard will present an "Overview of the Exxon Valdez Accident" and cleanup at the next Air Force Communications and Electronics Association meeting.

The meeting will begin at 11:30 a.m. Thursday at Lakewood Yacht Club. For reservations, call Veronica Mullins, 283-7342, or Luz Wood, 283-7308, by noon Tuesday.

## Astronauts get assignments for four 1993 shuttle missions

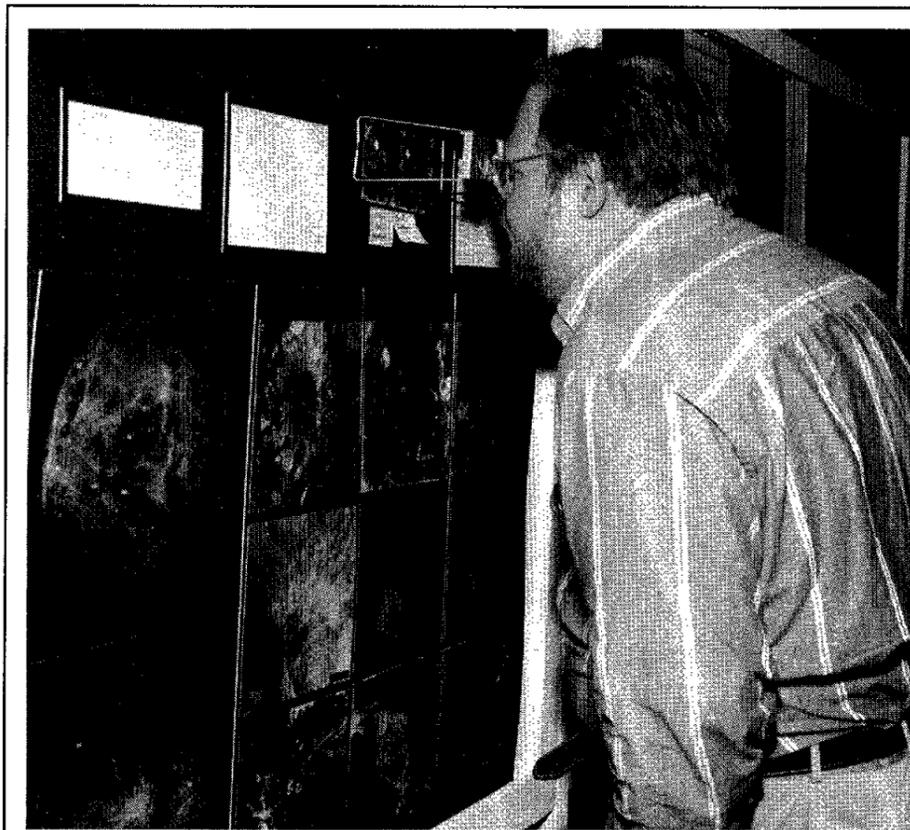
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Other STS-56 crew members will be Stephen S. Oswald, pilot; Kenneth D. Cockrell, mission specialist; Michael Foale, Ph.D., mission specialist; and Ellen Ochoa, Ph.D., mission specialist.

Cameron was the pilot on the STS-37 Compton Gamma Ray Observatory mission in April 1991. Oswald was the pilot on the STS-42 IML-1 mission. Foale is scheduled to fly as a mission specialist on the first ATLAS mission later this month. Cockrell and Ochoa will be making their first shuttle flights.

Ronald J. Grabe, another Air Force colonel, has been chosen to command STS-57 scheduled to launch in mid-1993. STS-57 will carry the commercial middeck augmentation module called SPACEHAB and retrieve the European Retrieval Carrier.

Other STS-57 crew members are Air Force Lt. Col. Brian Duffy, pilot; G. David Low, payload commander



JSC Photo by Robert Markowitz

**VENUSIAN VIEW**—Paul Helfenstein of Cornell University peers at a stereoscopic image that was part of a poster display at the 23rd annual Lunar and Planetary Science Conference this week at the Gilruth Center. Much of the discussion at the conference focused on data and images from Magellan's survey of Venus, and the stereo image was part of a display on Large Shield Volcanoes on Venus Distribution and Classification. The conference concludes today with presentations that concentrate on Mars, its atmosphere and its geology.

## Human Resources sees hiring freeze, not layoffs

Situation could change as Congress, Headquarters work with budget

(Continued from Page 1)

million is pure salaries and benefits. A lot of the other remaining money you have to pay by law, including things such as merit pay and within grade increases," Hartman said. "The discretionary part of the budget — what you can curtail and still pay everybody and not violate any laws — is really only about \$14 million."

Human Resources is striving to strike the most livable balance be-

tween cuts in full-time permanent staff and other resources and programs that support each directorate's human resources needs, Hartman said. Under the current plan, any reduction in the number of full-time employees will come through a hiring freeze, not layoffs, he emphasized.

"It's really too early to talk about numbers in any more detail," Hartman said, "but '93 is going to be a really tight year for all the

NASA centers from a personnel standpoint."

Possible options for accommodating the shortfall include some reduction in the number of promotions, awards and overtime pay; elimination of temporary and a number of summer employment programs; reduced student programs, limitations on funds available for training, and constraints on moving costs.

There will be at least two more

opportunities for JSC to receive a higher mark from NASA Headquarters or to come up with different approaches to dealing with a shortfall.

"These problems are not exclusive to JSC," Hartman emphasized. "All of the centers are having similar problems and so are many of our contractors. Over the next few months we'll be working with all the organizations to find the best solutions to this difficult problem."

## Space News Roundup

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

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

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

## Brand to plan aero-space plane

(Continued from Page 1)

assembly of the space station. Brand has received many awards, including the Federation Aeronautique Internationale Yuri Gagarin Gold Medal (1976) and De La Vaulx Medal (1983), the AIAA Special Residential Citation (1977), the AAS Flight Achievement Award for 1976 (1977) and two NASA Space Flight Medals (1983 and 1984).

"I thoroughly enjoyed my 25 years at Johnson Space Center and the great experience of working on the programs from Apollo through space shuttle. I appreciated working with the caliber of peo-

ple at JSC and have many friends here. Unfortunately, my family and I have to leave the area to start my new assignment. However, I am looking forward to the challenge of working on the aero-space plane with its advanced technology and single stage-to-orbit objective."

Flight Crew Operations Director Donald R. Puddy said, "Although Vance will be missed at JSC after a long and successful career, I'm glad he will continue working within the NASA family. He will have an opportunity to apply his multi-program engineering background and space flight experience to this exciting new project."

## Endeavour on pad, preparing for flight readiness firing

(Continued from Page 1)

16 are under way at Launch Pad 39B. Endeavour was moved to the pad one week ago. A test of the electrical and mechanical systems in the main engines, called the engine flight readiness test, was conducted Thursday. A leak check of the main

engine plumbing found no problems.

Workers are installing special instrumentation for the test firing, preparing the crew cabin for STS-49, and cleaning Endeavour's cargo bay. Endeavour's first space flight is targeted for a liftoff in early May.

Meanwhile, in KSC's No. 3 pro-

cessing hangar, Columbia is also undergoing main engine tests this week. The three main engines were installed late last week as was the extended duration orbiter pallet, which carries additional hydrogen and oxygen that will allow Columbia to stay in space for 13 days.