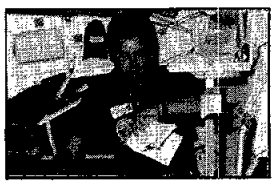
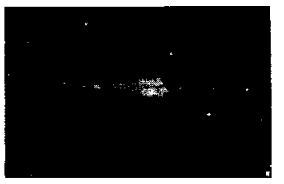
NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas



Off-the-shelf

Off-the-shelf products make a big contribution to space shuttle flights. Story on Page 3.



Between stars

The Cosmic Background Explorer is helping scientists understand the galaxy's heating and cooling. Story on Page 4.

Space News Roundup

Vol. 30 | January 18, 1991 | No. 3

War leads JSC to close some buildings to public

Visitor Center, cafeteria remain open

By Kelly Humphries

JSC will remain open to the public in spite of the recent outbreak of hostilities in the Persian Gulf area, but some facilities will be temporarily closed to visitors.

JSC Security Chief Everett Shafer said the security precautions should have minimal impact on employees.

"What we are doing is asking employees to heighten their awareness of things going on around them," he said.

Anyone who notices any suspicious people, items, happenings or telephone calls should report them to Security at x34441 during business hours, or at x34658 at other times, he said.

"Our information indicates a very low potential for any problems at our facility, but prudent management requires us to take these actions," said Center Operations Director Ken Gilbreath.

"Every effort will be made to minimize the inconvenience and impact to employees," he added. "We will keep all personnel apprised of the situation."

Please see **IRAQ**, Page 4

Avenues open to support those on duty

Several avenues of offering support to the soldiers and families of those affected by increasing tension in the Persian Gulf area are opening up for JSC employees.

Direct support may be offered to JSC employees who have been called to active duty because of Operation Desert Storm by writing letters or sending packages.

JSC's Employee Assistance Program may start a center support group for families and friends if enough people are interested, said EAP Coordinator Connie Alexander. The group mostly likely would meet weekly on site, she said. If you would like to be part of such a group, contact the EAP office at x36130.

The Clear Lake Service Center of the American Red Cross is continuing to hold support group meetings for families and friends of those serving in Operation Desert Storm. Meetings are at 7 p.m. on the second and fourth Friday of every month at the United Way Building, 18301A Egret Bay Blvd. For more information, call 333-9700, ext 39.

The mailing addresses for JSC civil servants on active duty are:

Please see **DESERT**, Page 4

Discovery prepared for move

By James Hartsfield

Preparation of *Discovery* for STS-39 remains on schedule in Bay 1 of Kennedy Space Center's Orbiter Processing Facility, and the spacecraft may be moved and mated with its external tank and solid rocket boosters as early as Jan. 29.

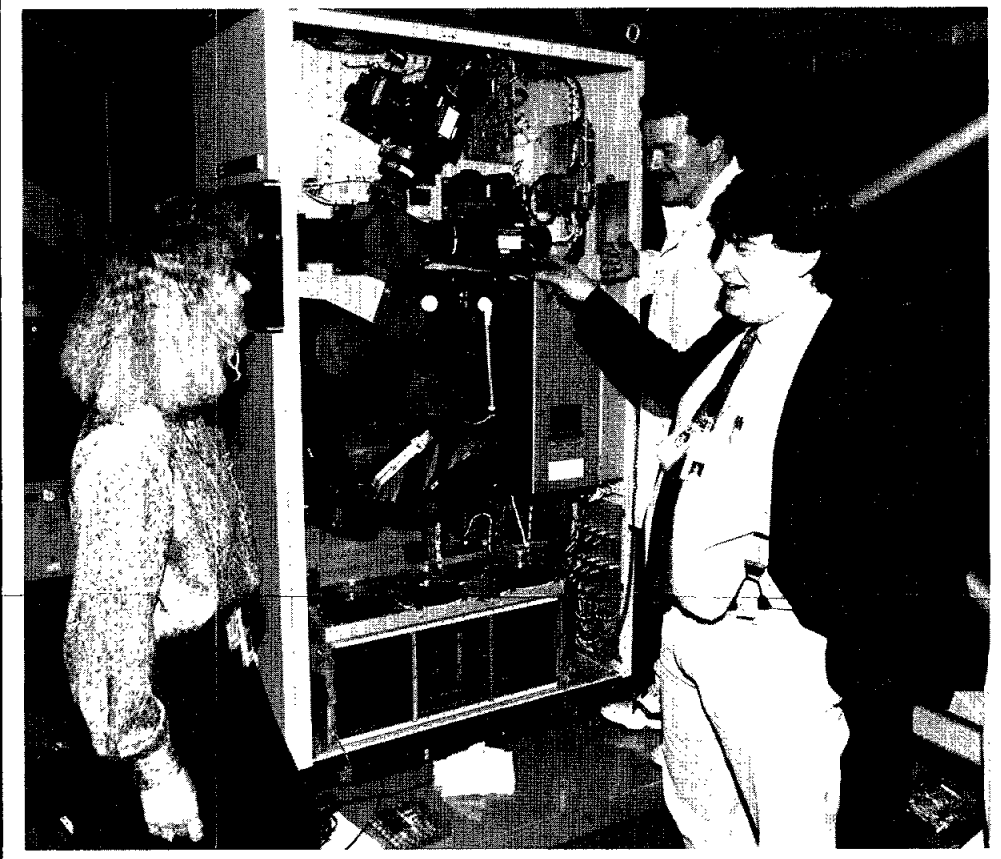
This week, work has focused on *Discovery*'s hydraulic system, which operates the nose wheel steering, landing gear, brakes, elevons, rudder and speed brake. All three auxiliary power units, hydrazine-fueled units that power the hydraulics, have been cleared for flight. Functional tests of the brakes, landing gear and nose wheel steering were successful Wednesday.

In KSC's Vertical Processing Facility, several STS-39 payloads, the Air Force Payload-675; the Infrared Background Signature Survey mounted on the Shuttle Pallet Satellite-2 and the Space Test Program-1 are in a vertical position undergoing final testing. These payloads are to be moved to Launch Pad 39A around Feb. 1 to await *Discovery*. Other STS-39 payloads already have been installed in the cargo bay.

In the OPF's Bay 2, work also is on schedule to prepare *Atlantis* for STS-37, planned to launch in early April.

Installation of *Atlantis*' three main engines will begin this weekend. Elsewhere, thrusters are being installed in the two orbital maneuvering system pods designated for *Atlantis* in KSC's Hypergolic Maintenance Facility. In the Vertical Assembly Bldg., stacking operations are under way for STS-37's solid rocket boosters with build-up in progress this week on the right booster.

Columbia is in the VAB's High Bay 2, where it has been since its return from STS-35 last month, waiting to take *Discovery*'s spot in the OPF.



JSC Photo by Bob Walck

A new state-of-the-art computer-driven projector settles into its new home behind the 10-by-20 screen in Flight Control Room 1. Project managers Adrianne Blume, left, and Marty Skudlarek, right, discuss the installation with Hughes Aircraft Co. technician Bruce Ahrns.

Projecting a better image

By Kelly Humphries

First they replaced the giant Mission Control Center screen. Now they're replacing the projector behind it.

Technicians last week installed a new one-of-a-kind liquid crystal light valve projection system behind the 10-by-20 orbital tracking display screen in Flight Control Room 1 in Bldg. 30, and the gradual switch to the new system should be complete in about six months.

The projector, designed by Hughes Aircraft Co., replaces an old-fashioned mechanical slide projection system that has been in use for the past 25 years. The new projector uses a computer work station and specialized graphics processor to do what the old system did—and more.

"What we're doing is replacing the 1950s technology with state-of-the-art computer-driven display technology," said Marty Skudlarek, project engineer for Loral Space Information Systems. "It's more than just a world map now."

The projector uses a light valve to control the amount and color of light coming from a xenon lamp, providing more light energy and improving resolution. The new projector will

Please see **PROJECTOR**, Page 4

Truly extends space station restructuring

The restructuring of Space Station *Freedom* now under way will be extended to allow NASA and its international partners to incorporate advisory committee recommendations, NASA Administrator Richard H. Truly said late last week.

NASA also will work with the Office of Personnel Management on a system to improve the agency's ability to attract and retain top-flight scientists, engineers and other specialists, Truly said in his Jan. 11 report to the National Space Council.

The moves are the latest in a series of efforts to implement the recommendations of the Advisory Committee on the Future of the U.S. Space Program.

Last month, Truly pledged to "to move out aggressively across the board" on the report, made public Dec. 10. The report included 15 formal recommendations and numerous other suggestions for consideration by NASA. Some of the items will require action by the White House and/or Congress, and many depend on adequate funding being made available.

The three-month assessment of Space Station *Freedom* began in November in the wake of Congressional passage of a budget that included $1.9 billion for space station instead of the $2.4 billion requested by President Bush. Congress set Jan. 22 as the deadline for the study's completion, but has agreed to an extension to consider the advisory committee's recommendation that *Freedom* be "reconfigured to reduce cost and complexity."

Space science will remain NASA's priority as an essential element of a balanced civil space program, Truly told the space council, and life sciences and microgravity research and applications will be the purpose of the Space Station *Freedom* Program.

The existing strategic plan for space science and applications, as endorsed by the scientific community, will be implemented by NASA, as recommended by the advisory committee, he said.

In response to another of the advisory committee's recommendations, he said, a special Task Force will be formed with the Department of Defense to assess development of an evolutionary heavy-lift launch vehicle. Over the next two months, the task force will assess launch technologies and options for development.

Truly said NASA also will study the committee's

Please see **TRULY**, Page 4

Big economic impact in '90

JSC injects $1 billion locally

JSC's contributions to the Houston-area economy topped the $1 billion mark in fiscal 1990, an increase of $209 million over fiscal 1989 and $782 million over a decade ago.

According to the latest economic impact report from JSC's Office of the Comptroller, the center spent $1.2 billion — about $1 billion in goods and services from local firms and $174 million for federal salaries and travel. That's about $4.6 million each working day.

JSC received $2.5 billion, or about 20 percent of the $12.3 billion NASA budget in fiscal '90. The major portion of JSC's budget went for space shuttle production and operations, space station development and related research and development.

Space Flight Control and Data Communications funding, which includes shuttle production and operations, totaled $1.1 billion. Space Station *Freedom* and other space-related R&D cost $1 billion. Research and program management, which includes federal salaries, travel and JSC facilities operation and maintenance, received $321 million.

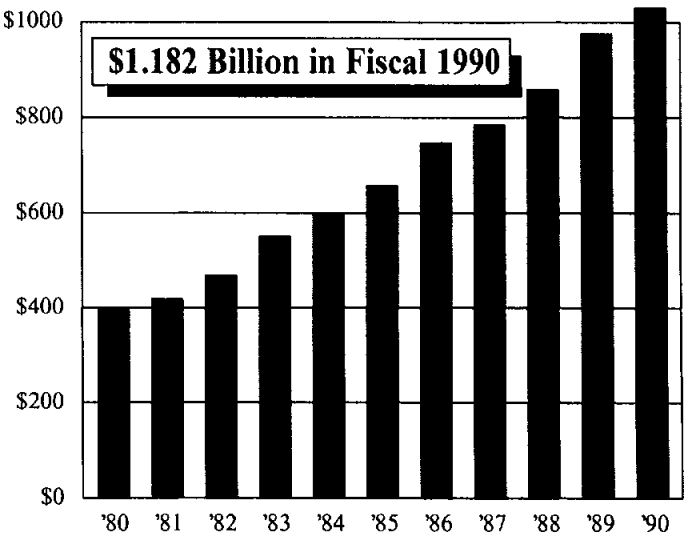
Facility construction took a large jump, from $14 million in fiscal '89 to $61 million in fiscal '90.

The center employed 16,750 people in 1990, including 3,751 NASA civil servants, 12,716 contractors and 283 miscellaneous government and service employees.

The average age of JSC employees was 42, and the average annual federal salary was $45,560. Seventy-four percent of JSC's civil service employees hold bachelor's degrees, 23 percent hold master's degrees and 5 percent hold doctorates.

Utility costs for the center were $2 million for gas, $8.8 million for electricity, $9 million for communications and $500,000 for water and sewage treatment.

Millions Fed Into Local Economy



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 each.

AMC Theater (valid until May 1991): $3.50 each.

Thermographed raised lettering and logos business cards can be ordered by civil service employees in Bldg. 11 - 250 cards per set: old logos-$21; new logos-$18.

Stamp Books (20-25 cent stamps): $5.

Alaska Trip: (May 24-June 2, deposit of $200 due Feb. 15, balance due April 25, price depends on number of people): $1,750 to $1,900.

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.

EAA badges—Dependents and spouses may apply for a photo I.D. 6:30-9 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m., Jan. 26 or Feb. 16. Cost is $15.

Aerobic dance—(8 week session) 5:15-6:15 p.m. Tuesday and Thursday nights. Cost is $24.

Exercise class—5:15-6:15 p.m. Monday and Wednesday nights. Cost is $24.

Weight safety—Required course for employees wishing to use the Gilruth weight room. The next class will be held from 8-9:30 p.m. Jan. 30. Cost is $4.

Country and western dance—Beginning and intermediate class begins March 4; class meets Mondays for six weeks. Cost is $20 per couple.

JSC

Technical Library News

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

Federal Financial Support for High-Technology Industries. Congressional Budget Office, 1985. HC110.H53 F43 1985.

Group Problem Solving: An Improved Managerial Approach. Harvey J. Brightman, 1988. HD30.29 .B73 1988.

Just in Time: Immediate Help for the Time-Pressured. Robert D. Rutherford, 1981. HD38 .R85 1981.

Unblocking Organizational Values. Dave Francis, c1990. HD58.7 .F69 1990.

Team Building Videorecording: How to Motivate and Manage People. Mark Sanborn, c1989. HD66 .S26 1989.

The Facilities Manager's Reference: Management, Planning, Building Audits, Estimating. Harvey H. Kaiser, 1989. HD1394 .K34 1989.

The Defense-Space Market: A How-to-Guide for Small Business. Philip Spencer, c1985. HD2346.U5 S64.

Government Data Publications. Directory of Primes. HD3861.U6 D57.

JSC

Dates & Data

Today

King program—The JSC Black Cultural Association will commemorate Dr. Martin Luther King Jr.'s contributions to American Life at 11 a.m. Jan. 18 in the Gilruth Center Ballroom. The program will include a film honoring King, presentation of the Dr. Ronald E. McNair Scholarship Award and a panel discussion on "Lessons Learned: The Impact of the Civil Rights Movement on the 21st Century." Shuttle Bus A will pick up employees in Bldg. 4 at 10:35 and 10:55 a.m.; Bldg. 1, 10:40 and 10:58 a.m.; Bldg. 45 at 10:55 and 11:05 a.m. Bus A will leave the Gilruth at 12:05 p.m. Shuttle Bus B will pick up employees in Bldg. 419 at 10:45 a.m.; Bldg. 350 at 10:48 a.m.; and Bldg. 227 at 10:51 a.m. Bus B will depart the Gilruth at 1:10 p.m.

HSS meets—The Houston Space Society will meet at 7:30 p.m. Jan. 18 at the University of Houston, Atlantic Rm. Michael Stanford will speak on "Impact of Space Radiation on Manned Space Operations." For more information contact 639-4221.

Cafeteria menu—Special: tuna and salmon croquette. Entrees: pork chop with yam rosette, Creole baked cod. Soup: seafood gumbo. Vegetables: Brussels sprouts, green beans, buttered corn, whipped potatoes.

Monday

Martin Luther King Day—Most JSC offices will be closed Jan. 21 for observance of the Dr. Martin Luther King Jr. Day holiday.

Tuesday

BAPCO meets—The Bay Area PC Organization will meet at 7:30 p.m. Jan. 22 at the League City Bank and Trust. Call Earl Rubenstein, x34807, or Tom Kelly, 996-5019, for more information.

Cafeteria menu—Special: stuffed cabbage. Entrees: turkey and dressing, round steak with hash browns. Soup: beef and barley. Vegetables: corn cobbette, okra and tomatoes, French beans.

Wednesday

Talking safety—The SAFE Association will meet at 5:30 p.m. Jan. 23 at the JSC Safety Learning Center in Bldg. 226N. Robert Brennecke will discuss "Occupational Exposures to Hazardous Chemicals in Laboratories." For more information contact Karin Porter at x33381.

Cafeteria menu—Special: pepper steak. Entrees: catfish with hush puppies, roast pork with dressing. Soup: seafood gumbo. Vegetables: broccoli, macaroni and cheese, stewed tomatoes.

Thursday

AIAA meeting—The American Institute of Aeronautics and Astronautics will meet at 5:30 p.m. Jan. 24 at the Gilruth Center. Konrad K. Dannenberg, 1990 AIAA National Durand award winner, will speak. Members and spouses $8; nonmembers $9; and students/young members $7. Dinner reservations deadline is noon Jan. 18. For more information, call 333-6064, 283-4214, 283-6000 or 282-3160.

SCS meeting—The Society for Computer Simulation will meet at 11:45 a.m. Jan. 24 at the Lockheed Plaza 3. No reservations or badges required. Non-members are welcome. Carl Opaskar, a former FORTRAN programmer, will speak. For more infomation, contact Robin Kirkham, 333-7345 or Wade Webster, 244-4306.

NASACOM meeting—NASACOM will meet at 7:30 p.m. Jan. 24 at the Clear Lake Park Bldg. For more information, contact Glenda, x31764.

Cafeteria menu—Special: chicken fried steak. Entrees: beef tacos, barbecue ham steak, Hungarian goulash. Soup: turkey and vegetable. Vegetables: spinach, pinto beans, beets.

Friday

Cafeteria menu—Special: tuna and noodle casserole. Entrees: liver and onions, deviled crabs, roast beef with dressing. Soup: seafood gumbo. Vegetables: whipped potatoes, peas, cauliflower.

Jan. 30

NCMA classes—The National Contract Management Association and University of Houston-Clear Lake are sponsoring a course in negotiation of contracts. The classes will begin 8 a.m. Jan. 30-31 at the University of Houston at (303) 939-5147.

Feb. 27

Laptop showcase—The Information Systems Directorate is sponsoring a notebook laptop showcase from 10 a.m.-4 p.m. Feb. 27 in Bldg. 12, Rms. 112, 254, and 256. For more information call the Product Demonstration Facility, x37572.

March 5

Space conference—The Space Foundation will co-sponsor the third annual Space: Technology, Commerce & Communications Southwest conference March 5-7 at the Nassau Bay Hilton. For more information contact Roseann Tully at 617-862-7174.

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. 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: Villa on the water w/boat access to Clear Lake, pool, club house, pier, $43K. Mr. Collins, 480-8190 or 996-7693.

Sale: Hot Spring Village, Ark., wooded lot, util, improvements, $9,800, OBO. 326-1254 or 333-6150.

Sale: Kerrville, TX, 12x60 mobile home, furn., good cond., lg. CP, lg. cov. patio, $6K. 333-6150 or 326-1254.

Lease: Sagemont, 1.5 story, 4-2-2, 2,200 sq. ft., gas heat, FPL, new paint/carpet, fans, fen. yd. w/trees, $675 plus dep., no pets. 484-4944 or 333-6806.

Sale: Dickinson/Sherwood Forest, brick, 3-2-2, lg. pool/spa, patio, CA/H, FPL, lg. den, formal DR, fans, $140K, assum. 8.5% FHA. Chris, 337-5410 or 280-1944.

Lease: Friendswood/Wedgewood Village, 3-2-2 w/ lg. rec room, new roof, 2K sq. ft., $74,900. 333-7010 or 482-5393.

Lease: Webs./Ellington, 2-1 apt., $425/mo. Dave, x38156 or x38161.

Sale: lg. res. lot, corner lot, all util. 996-9157.

Sale/Lease: Egret Bay, 2-2-2, 2 patios/stor., FPL, W/D, all appli., no pets, $46K or $500/mo. Betty, 486-9505.

Rent: Baywind I, 1 BR condo, immed occ., $390/mo. plus dep. Doug, 480-9280 or 532-4766.

Lease: Egret Bay Villa, 1-1-2CP, FPL, micro., W/D, fans, blinds, patio, $425/mo. 335-1451.

Rent: CL townhouse, 2-2.5-2, FPL, all appli., fresh paint, $800/mo., nonsmoker. 488-2664.

Sale: Friendswood lot, 120x162, all util. avail., $34K. Rick, 283-1988 or 996-8961.

Rent: Galv. condo, 2-1, FPL, all appli., new carpet, $495/mo. 488-2664.

Sale: 3/4 acre lot, Pearland, all util., $27,500. 992-1913.

Sale: Univ. Green townhouse, 3-2-2, fans, FPL, whirlpool, loft, decked crtyd., 2 min. to JSC, $90K. Dennis, x34405 or 480-5076.

Sale/Lease: Bay Glen, 3-2-2, 2,050 sq. ft., formal DR, study w/French doors, $122,500 or $1K/mo. 480-0527.

Sale/Rent: Friendswood, 2,700 sq. ft., 4-2.5-2, den, FPL, lg. pool, $1,100/mo. or $125K. x33182 or 996-1360.

Lease: 2-2 condo in CLC, 5 min. from NASA, fem. nonsmoker, no pets, $325/mo. plus 1/2 util. Mary, x30275 or 488-6908.

Sale/Lease: Univ. Trace condo, 1-1-2, ground floor, all appli., FPL, $380/mo. plus dep. Gilbert, 333-4306.

Sale: 60 acres on Hwy. 80, 3 mi. from Karnes City, TX, 50 mi. from San Antonio; 2-story house on 1.5 lot w/fruit trees in El Campo. 783-9164.

Sale: 4-2.5-2, Oak Brook, new carpet, backs up to golf course, $98K. 488-1374.

Rent: Vistana Resort condo at Epcot/Disney World entrance, Mar. 8-15, sleeps 8, $700. Phil, 283-5648.

Sale: Bayfront lot in Seabrook, $125K; 2 waterview lots near NASA, $38,500/ea. Don, x38039 or 333-1751.

Sale: Ellington/Sycamore Valley, 3-2-2, tall fen. w/ wide gate, stor., new paint/floors, $62,500. Bill, x30164 or 481-6340.

Rent: Galv. condo., furn., sleeps 6, Seawall Blvd. & 61st, diy/wkly/wknd rates, cable. Magdi Yassa, x33479 or 486-0788.

Cars & Trucks

'90 Mazda 626 LX, loaded, sunroof, ex. cond., warr., $1,500 equity and refin. balance. Thelma, x33107 or 633-9424.

'89 Firebird Formula 350, 24K mi., pwr., ext. warr., $10K. Chris, 280-1944 or 337-5410.

'86 Toyota Camry, ex. cond., auto., 65K mi., $5,997. 474-3507.

'90 Plymouth Grand Voyager SE, loaded, V6, pwr., 8K mi., $15,700. x30985 or 480-3270.

'86 300 ZX, ex. cond., T-top, loaded, auto., 90K mi., $8,600. Ray, x30643 or 488-4373.

'79 Olds Delta 88, 70K mi., 4-dr., pwr., 301-V8, new brakes/tires, $2,500, OBO. 339-1337.

'88 Toyota Camry LE, sunroof/moonroof, loaded, ext. warr., 36K mi., ex. cond., $10,700, OBO. Brian, 283-4126 or 996-9415.

'86 Buick Regal Ltd., V8, 2-dr., pwr., loaded, ex. cond., 70K mi., $5,800, OBO. 282-4041 or 337-2318.

One yr. old Chevy Corsica, 17K mi., take over GMAC loan w/pmts. approx., $212/mo. 282-3972 or 488-4207.

'87 Chev. Cavalier, 4-dr., auto., 37K mi., ex. cond., warr., $4,200, OBO. Dave, x39579 or 482-6187.

'73 GMC Sierra truck, good cond., 454 eng., AC, camper, $1,400. Floyd, x37467 or 486-4043.

'89 Firebird, auto., 13.8K mi., 12 mo. tune-up warr., $9,700. Carrie, x38506 or 333-4089.

'83 Jeep Cherokee Chief, V8, 360 cu. in., 4 wheel drive, auto., fog lamps, lugg. rack, $4,200. 280-0828.

'79 Dodge Van, runs great, $1K, OBO. 283-6532 or 486-0581.

'83 Plymouth Turismo, 2-dr. htchbk., ex. cond., 62K mi., 5-spd., $2,100, OBO. Dennis, x34405 or 480-5076.

'80 Pontiac Phoenix, V6, 5-dr. liftback, new auto. trans. w/1 yr. warr., new batt., runs good, $2,350. x30092 or 481-3637.

'84 Ford PU, V8 w/camper, 71K mi., very good cond., $4,950. x37883 or 337-5482.

'83 Olds Delta 88, 65K mi., new paint, ex. cond., $3K. Sally, x31092.

'71 Volkswagon Super Beetle, not running, restoration project, $600. Dave, x33433 or 480-0123.

'84 Buick Skylark, 4-dr., $1,850, OBO. 482-1659.

'76 TR7, hard top, 86K mi., $2,500. Tom, 482-2575 or Howard, 488-3875.

'78 LTD II Brougham, V8, auto., pwr., 61K mi., $1,950. 481-1382.

'86 Ford Temp., 4-dr., new tires, ex. cond., $2,900. 554-4750.

'80 Toyota Celica, auto., good cond., 85K mi., new batt./carb./stickers, $3,300. 486-4265.

'79 Toyota 4 WD truck, good cond., good tires, $3,900. Bob, x34409 or 393-1670.

'88 Cutlass Supreme International, 2-dr. spt. coupe, 2.8 multiport fuel inj., pwr., 37K mi., $8,800, OBO. Kirk, 282-2911 or 332-5876.

'85 Buick Regal, good tires, $2K. x32987.

'86 Honda Prelude, 5-spd., sunroof, new tires/brakes, $6K. x31237 or 488-8614.

'85 Chevy S-10 Blazer, V6, auto., good AC/tires, pwr., 63K mi., $5,700, OBO. x31913 or 486-9488.

'81 Thunderbird, runs good, $1,400, OBO. Bob, 283-4146.

'85 Mitsubishi Starion, 5-spd., turbo, ex. cond., $3,450. 282-2810.

Cycles

Blue Huffy 10-spd. bike, good cond., $40. 337-3122.

10-spd. bike, $40, OBO. David, x36647 or 526-3045.

'81 Honda 400cc motorcycle, low mi., new tires, good cond., $650. 283-5681 or 482-8307.

'80 Honda CB 750, good cond., $650. 337-1896.

'75 Honda 550cc motorcycle, good cond., new batt./back rest/roll bar, $425. x30686 or 480-3260.

Boats & Planes

13' fiberglass sailboat, main, jib, galv. trlr., $600. Bob, 482-9576.

25hp Evinrude, elec. start, new, $1,700. Jerry Craig, 283-5311 or 420-2936.

Glastron, 18.5' ski boat, walk thru windshield, trihull, deep V at transem, 135hp Johnson OB, trlr., ex. cond., $3,495. 244-9843 or 532-2215.

'89 Jet Ski 650 SX w/dbl. ski trlr., ex. cond., $3K, OBO. Mark, 488-4017.

'79 Renegade 1540 ski boat, 140hp Evinrude, SST Prop, trlr., ex. cond., $2,500, OBO. 333-6868 or 486-7846.

'72 30' Morgan sailboat, new diesel eng., $17,500, OBO. Bill, 283-5384 or 326-1880.

'83 Renken 18' sailboat, roller furling jib, 4hp aux., galv. trlr., sleeps 4, good cond., $4K. 339-3476.

Audiovisual & Computers

Stereo, MCS, 300 watt w/rec. and amp, 2 spkrs., CD player incl., $250. 482-0068.

Emerson 25" color stereo TV w/rem., $200; Panasonic 4 head hi-fi stereo VCR w/rem., $175; Memorex Universal rem. control, replaces up to 8 remotes, $45. 486-5734.

Sony 5-disc changer CD player w/all features, ex. cond., $150, OBO. x37990.

Apple IIc in ex. cond., monochrome monitor, Okidata U92 printer, joy stick, SW, $550 or w/computer desk/chair, $650. Sheri, x32243 or 486-6674.

Commodore 64, stock analyzer, automodem, BO. Dianne, x32072.

AT&T 6300, 640K, monochrome, 20MB HD, 1-360 FD, $600; Daisy Wheel printer, 40 CPS, $150. Richeson, x37005 or 488-8761.

Lotus 1-2-3 version 2.2 on 3.5" format diskettes w/ doc., unopened, $75. David, x32751 or 326-1069.

Apple II plus, monitor, printer, disk drive, Visicalc spread, $400. 332-7082.

Lotus 1-2-3 V 2.1 student ed., $50; Turbo C V 2.0, $50; Quattro, $50; PC's Limited 286, 1.2 MB floppy, Super UGA, 80 MB HD, 8 MB RAM, $1,150; IBM printer, 9 pin, $85. 339-1337.

Pioneer ster. rec., turntable, Marantz spkrs., $200, OBO. Jeff, x30374 or 488-2405.

IBM XT computer, 640K mem., 30 MB HD, 2 floppies, color Hi-Res monitor, $975; Intel 386 inboard for IBM or Compaq, 1 meg mem., Intel warr., $375. x30092 or 481-3637.

Macintosh 512 Enhanced, 800K drive, used very little, $450. 280-8796.

Musical Instruments

Schaeffer-Chicago piano, ex. cond., $750, OBO. 488-0620.

Miyazawa silver finish, Model 955 RH flute, low B flat key, ex. cond., $900. 488-4915.

Gemeinhardt 2 SP beginner flute, ex. cond., $200. 488-4915.

Pets & Livestock

13 yr. old Arabian gelding, bay, AHRA reg., $750. 244-9839 or 331-3904.

Min. chocolate poodle, 6 yrs. old, needs full time company, neutered, housebroken. 488-0946.

Cocker Spaniels, AKC, champion sired, M & F, blacks, blk./tan, $200-$250. (409) 925-1819.

Reg. exotic min. Vietnamese pot bellied pigs, $300-$2K/ea.; exotic doves & finches, $5/ea. James, 335-6710 or 482-6744.

AKC Pekingese pups, born 12-9-90, 2 M red sable w/white feet, 4 point sire, champion bloodline, $250. Sharen, x49737 or 473-6754.

AKC Pekingese pups, 3 F, 1 M, blk., fawn, blond, 4-8 wks., champion bloodline, $250-$300. Sharen, x49737 or B.J., 473-4645.

Tiny Toy poodle pup, male, apricot, AKC reg., champion bloodline, born 10-31-90, $300. Heather, x30582 or 332-9221.

Free Lab mix pups, 3 F, 2 M, born 11-19-90. Kim, 283-5703 or 559-2764.

Rabbits, mini-lops, New Zealands. Gailo, 554-6200.

Photographic

Olympus OM-10 w/50mm F1.8-16 lens and electronic flash, $100, OBO. Dana, x33686 or 480-4636.

Minolta XG-1 35mm camera w/45mm F2.0 lens, 132x auto flash, 2x tele, case, manuals, ex. cond., $125. 332-8119.

Pentax 35mm camera w/28mm, 50mm, and 300mm lenses, 3x tele, case, tripod, $200. 339-3476.

Household

Queen sz. wtrbd. w/40% waveless matt., mirr. bookshelf hdbd., padded side rails, fleece matt. pad, $125. Sheri, x32243 or 486-6674.

Toshiba microwave, 1.5 cu. ft., works well, $40. 482-5393.

Kenmore W/D, almond, good cond., $200/set, OBO. Mary Ann, 283-0430 or 475-2652.

Kenmore upright 2-spd. vacuum cleaner, $50. Jeff, x30374 or 488-2405.

Leather sided glass top coffee tables (2), $50; butcher block DR table w/chairs, $75; washer, $100; Amana Touchmatic II microwave, needs repair, BO. James, 335-6710 or 482-6744.

Panasonic 13" B&W TV, $50. Diana, x38680 or 427-7983.

Sectional sofa w/spring hide-a-bed and recliners, $800. 479-7940 or 280-1117.

Camel-back Chippendale sofa, beige w/green/rust pineapple print, ex. cond., $275. 480-0527.

Lg. Papa-San chair, $75; 2 princess chairs, $25/ea.; Rattan Bentwood rocker, $50; La-Z-Boy recliner, $75. Mark, x32781.

Twin sz. spring air ext. firm matt., box spring, ex. cond. w/hdbd., ftbd., frame, $40. 286-0910.

Heavy duty Kenmore W/D, good cond., $350/both. 332-4384.

Lg. pit group, brick color, coffee table, new cond., $575. x31466 or 534-3932.

Recliner/chair, $60, OBO; sofa, off white, 82 in., $200, OBO. 333-7345 or 474-2339.

Kenmore W/D, lg. cap., works well, $325. 474-2339 or 333-7345.

Modern bev.-edge rect. glass top DR table w/cream colored marble fin. trestle base, $280, OBO. Katie, x33185.

King sz. wtrbd. w/hdbd., semi-motionless matt. w/ cov. and htr., padded side rails, set of sheets w/ matching comforter, $250. Sam, 998-8090.

Queen sz. hide-a-bed, love seat, 3 tables, $400; BR set, antique green, full sz. bed, $750; G.E. dishwasher w/pot scrubber, needs adjustment, $75. Magdi Yassa, x33479 or 486-0788.

Wanted

Want fem. roommate, nonsmoker to live with in CL area. Caroline, 538-6356 or 493-3888.

Want housemate to share 2-story, 3-2.5-2 house with W/D, FPL, in LC, $290/mo. plus 1/2 util. 282-4843 or 332-7137.

Want van pool riders, Friendswood/Sagemont to Greenway Plaza. Mel, 623-3075 or 482-0888.

Want IBM PC 5-slot motherboard w/64KB 256KB mem., in working cond. David, x32751 or 326-1069.

Want alumni for the Embry-Riddle Aeronautical Univ. Houston Alumni Chapter. Jeff, 282-6644 or 484-4956.

Want fem. roommate, nonsmoker, no pets, to share 2-2 condo in CLC, 5 min. from NASA, $325/mo. plus 1/2 util. Mary, x30275 or 488-6908.

Want 2 roommates to share 4-2.5-2 new house, 10 min. to JSC, nonsmokers, $300/mo. plus 1/3 util. 474-5106.

Miscellaneous

Student desk w/chair, good cond., $40. Dianne, x32072.

Graco play pen, $45; crib bumper w/matching quilt, $30; century walker, $10; J.C. Penney 25" color console TV, doesn't work, $10. Michele, 482-9576.

Beta tapes, approx. 175 titles, $3/ea or $350/all; Craftsman cordless drill, $20; Black & Decker drill, $20. Frank x39924 or x33573 or 480-9376.

'84 Celebrity/Citation shop manual; '79 Olds donut spare tire w/wheel. Fred, 944-0493.

Roller skates, Protype, sz. 6 and 8, boys, ex. cond., BO. Aaron, 944-0493.

Desk, 7 drwrs., 48x18, good cond., $95. Ted, x36894 or 280-9595.

Bed liner, LWB Ford PU, reasonable. 486-1757.

Sears 10hp riding lawn mower, 30 in. deck, elec./rope start, runs, needs work, $125, OBO. Dennis, x34405 or 480-5076.

Metal office credenza, good cond., 2 hanging file drwrs., bookcase shelves w/doors, $175, OBO. Dennis, x34405 or 480-5076.

2 Wilson Profile tennis racquets, 95 sq. in. surface, $140/ea. or $250/both. Kyle, x38653 or 532-1130.

10" Newtonian Telescope, F/6, 2" x 1 1/4" focuser, 8x50 finder, German Equatorial Mount w/clock drive, $750. Anne, 332-4383 or 333-2688.

Behind the seat stor. organizer for full sz. PU, approx. 5x2.5 tall w/3 shelves, $20. Musgrove, x38356 or 488-3966.

Exer. bike, ex. cond., $35. Tony, x35966 or 488-3238.

Ladies 14K yellow gold wide band w/Marquis cut diamond, .46 carats, $1,200, nego. Mary, 992-2728.

Solid oak roll-top computer desk, $1,800; hunter green swivel and roll leather chair, $500; solid oak matching file cab., $300. Marnie, 922-1970.

Drafting stool, adjust., chrome steel w/foot ring, casters, uphol. seat & back, BO. Bob, 480-1225 or 474-4747.

'88 4x7 util. trlr., flat bed, light weight, $125. Greg, 282-3385.

Blk. wire mesh rims (4), 14" 5-lug, $200; dorm sized refrig., 2 cu. ft., Kenmore, good cond., $50. Rick, 283-1988 or 996-8961.

Free 10 lb. frozen hardboiled egg yolks. 333-6127.

Browning Citori shotgun, ex. cond., soft case, $750. 992-1913.

Ladies ski boots, sz. 8 1/2, $50; new Serta suntamp on 5' stand, $35. 486-0174.

Ladies foxtail jacket, new, $300. 486-0174.

Silver plated 6" Revere serv. bowl, new, $18. 486-8716.

Moving boxes, used once, $1/box. Mark, x34571.

Desk, 48x18, good cond., $95. Ted, x36894 or 280-9595.

Baby carrier car seat, $10; full sz. bed hdbd. and ftbd. w/frame, $20. 480-3424.

40 channel CB w/antenna, $40. 339-1337.

Franciscan Apple earthenware, $50 for 8-place setting w/bowls, cups, saucers; Braun 8-cup coffee maker, ex. cond., $30. 280-1117 or 479-7940.

Four track rec., ex. cond., $300. Jim, 333-7690.

4 new unfin. 12"x79" louvered door panels, $25. 482-8998.

Computer hutch, $50; din. table, $20; spkr. cab./end tables, $25/pr.; armchair, $15. 486-4265.

Soloflex wgt. mach., incl. butterfly, leg ext., wgts., ex. cond. Kirk, 282-2911 or 332-5876.

105 U.S. postage stamps (25¢), $25. Jeff, 333-7010 or 482-5393.

Full sz. Wilson golf bag, $45; exer. bike, $30; G.E. cordless phone, 2 phones, base unit, 2 rem. charging units, $95; round wood table w/glass top, $45. 538-1443.

Used Nintendo games, BO. 337-3122.

Leather jacket, inner lining, sz. 38, $50. Jerry, x38835 or 482-8494.

Heavy steel shelving units 3'x7'x14", $20/ea. x38039 or 333-1751.

LR furn., dark, $175; high performance stereo, $250; O'Brien water ski, $75; queen wtrbd. matt., $30. Tim, 996-9191.

Metal typewriter table, $20; cordless Panasonic phone, $25; 2 matching blackboards w/erasers, small, $20/both; light wgt. move truck, 2-wheel, $20; sm. lighted "Bar Open" light, $12.50; elec. drill, $7; flourescent desk light, $12.50. 488-5564.

30" round table w/4 antique Bentwood chairs, $125; antique ladder back oak rocker, rope seat, $50; corner chair, cane seat, $50; childs old table, $20; doll cradle w/doll, $15; childs antique ladder back rocker, matching chair, $25/ea. 488-5564.

Signed and numbered prints, framed, $25-35; blk. Italian feather sofa, chair, $700; blk. Melamine interchangeable modular ent. center, $250, all ex. cond. Katie, x33185.

Off-the-shelf and into the shuttle

STS-35 Mission Specialist Jeffrey Hoffman frees trapped goldfish crackers during the Astro-1 observatory flight.

By Kyle Herring

A man walks into a Clear Lake-area drug store. He's there to pick up combs, toothbrushes and some hand towelettes and hopes the store isn't crowded so he can get in and out quickly.

A mile away, another person talks to a saleswoman in an appliance showroom about video cameras.

Yet another person strolls through the aisles of a nearby grocery store looking for dry food snacks — perhaps "goldfish" crackers.

Though no one would know it by watching these three people, they are preparing for a mission — a space shuttle mission.

In a JSC conference room, Clay McCullough and Fred Burns of the Orbiter Projects Office meet with other members of the Flight Crew Equipment Board to determine what will fly aboard the space shuttles to support mission and crew requirements.

"We want to make the crew as comfortable as possible when they're up there doing a complicated job," said McCullough, Orbiter Flight Support Equipment Office manager.

Off-the-shelf products purchased to support shuttle missions not only make the crew feel more at home, but also save the cost of developing specialized products, he said.

"Reducing costs is always important to us," McCullough said. "We're always on the lookout to find something that's off-the-shelf and we try not to spend any money developing things."

Burns, the office's assistant manager, agreed.

"It would be foolish to go out and spend a lot of money on a product that can be purchased much cheaper directly from a store or the manufacturer," he said.

One example of off the shelf equipment used on the shuttle is binoculars.

The binoculars first are purchased from a commercial store based on the mission's requirements. Then they undergo several tests including flammability. With this in mind, a metal casing around the binocular is preferred over a leather surface.

Crew members' watches are not specially made for space flight. In fact, these days crew members likely will wear their own watches inside the orbiter although Apollo era watches are still in the flight crew equipment inventory and are used during spacewalks.

When the first commercial video camcorder flew on STS-30 in May 1989, it went through the same process as almost every other piece of equipment bought off-the-shelf.

Five of the camcorders were purchased off-the-shelf: one for flammability, toxicity and electromagnetic discharge testing; one for training purposes; one flight camera; one backup flight camera; and a spare.

"I don't know of anything we buy that doesn't go through at least the flammability and toxicity tests," Burns said.

Brand name selections do not figure in the decisions, McCullough said.

"We essentially go out with an invitation for bid stating the general specifications of what we need," he said. "The off-the-shelf product bids come in and go through the normal procurement process."

Once the requirements are determined and the specifications are set for a certain item, for instance the range of power or field of view of the binoculars, the items come to the board chaired by McCullough or Burns.

When approved for flight, the items then undergo the certification process required to assure the item is safe for flight.

While Boeing provides most off-the-shelf items as part of the Flight Equipment Processing Contract, the subsystem managers and safety, reliability and quality assurance personnel assist in approving all items for flight.

Board members do not handle each crew member's specific item requests, McCullough said.

"We don't talk with every individual crew member," he said. "It all gets funneled through one flight crew representative who conveys the combined crew requirements to the board."

Some of the items that are purchased off-the-shelf include cassette players, calculators, batteries, film, marker pens, and multipurpose knives. A portable compact disc player also is scheduled to fly soon aboard the shuttle.

Crew members' knit shirts with the embroidered mission logo also are purchased from a catalog.

Off-the-shelf products fall into the criticality three area, McCullough said. That is, these items are related to either maintaining the health and welfare of crew or so they can do their jobs properly as in photographic equipment or hygiene items.

Other orbiter stowable items and hardware systems are flown with higher "criticality" labels and do not include off-the-shelf products.

"These items are listed in the Program Requirements Document as flight equipment non-critical hardware which covers most of those types of items that are bought off-the-shelf," he said.

The crew members select their food for flight from an approved menu.

Though packaged differently than in the store to fit in the orbiter middeck lockers, the food is no longer squeezed from a tube as in the Apollo era.

The menu changes constantly based on crew preference for certain items. Some items are more popular than others as is the amount requested.

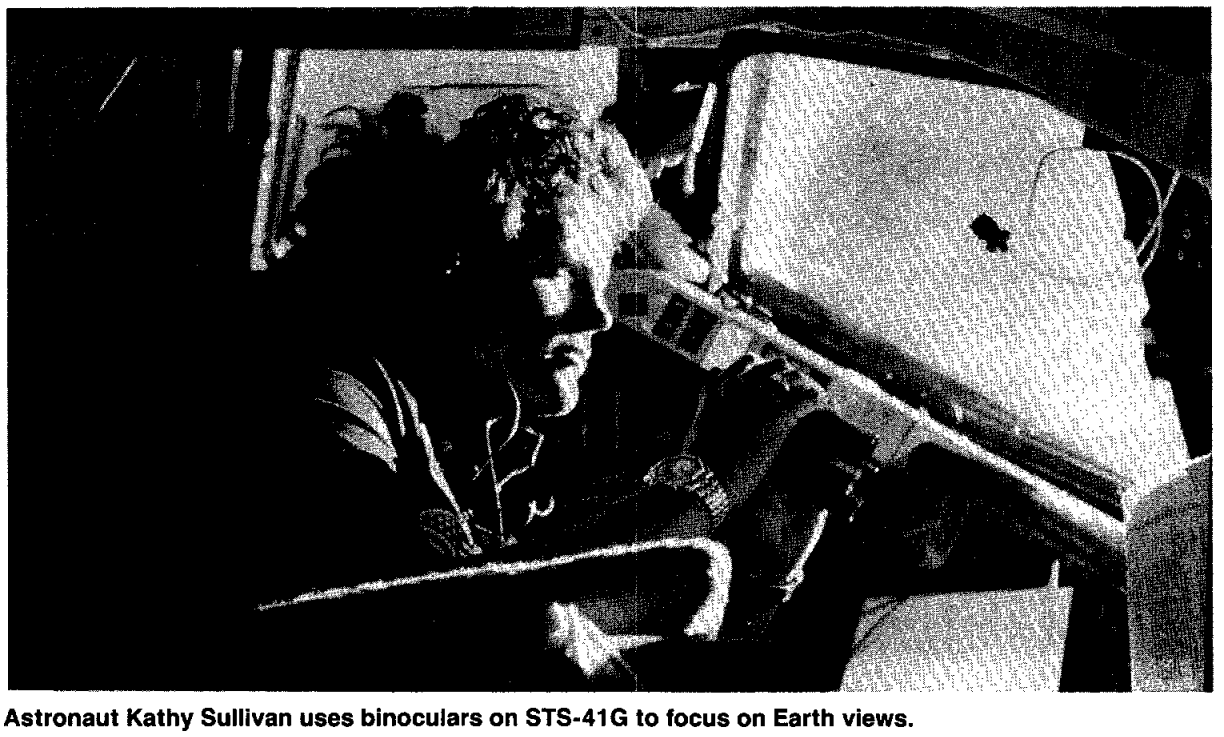
"We're always going through and evaluating the size of portions," Burns said.

For instance, tortillas recently have been more desirable than bread because there is a reduced chance of crumbs floating in the cabin. Goldfish crackers also are popular because they're easy to eat.

All food is stored in the vehicle's middeck lockers well before launch, except for food in the fresh food locker.

The last things purchased off-the-shelf and stowed aboard the vehicle prior to flight are fresh fruit and vegetables such as apples, bananas, oranges and carrots—right from the nearby grocery store.

STS-34 Mission Specialist Franklin Chang-Diaz uses a camcorder-style video camera to record activity aboard the Space Shuttle *Atlantis.*



Astronaut Kathy Sullivan uses binoculars on STS-41G to focus on Earth views.

In what appears to be a microgravity juggling act, Astronaut James Bagian is attempting to organize audio cassettes during STS-29.

Hayes new deputy Human Resources director


Hayes


Owens


Cohen

Gregory W. Hayes has been promoted to deputy director of Human Resources, sharing responsibility for the development and management of the center's personnel programs.

He replaces Harvey Hartman, who has been appointed acting director of Human Resources.

Hayes will continue to serve as chief of the Human Resources Management Branch, a position he has held since 1981. He joined JSC in 1973 as a management intern, became a personnel management specialist in 1974, and chief of the Astronaut Selection Operations Office in 1979.

Owens new chief of Facility Development

Graydon E. Owens was appointed chief of the Facility Development Division in the Center Operations Directorate, effective this past Sunday.

Owens, who has been manager of the Technical Operations Office since May 1989, succeeds E.D. Carter, who retired in November.

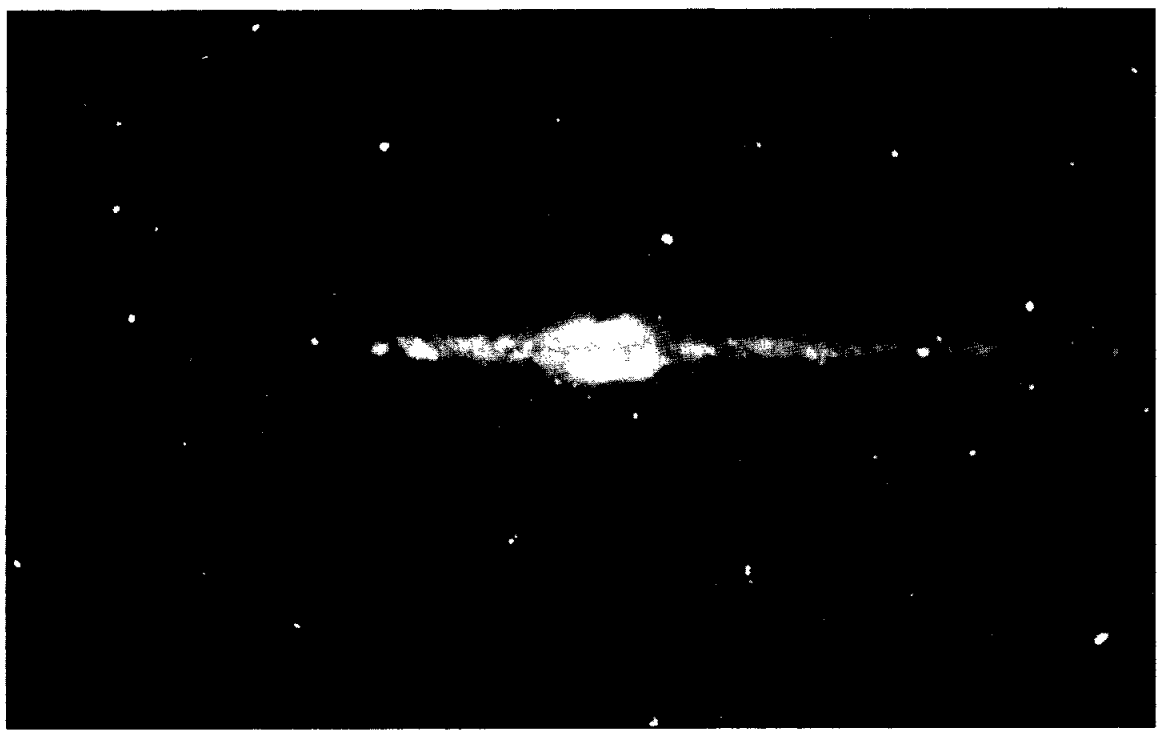
Owens joined NASA in 1965 as a machinist in the Technical Services Division, and transferred to the Facility Engineering Division in 1976. He had served as a project design engineer in the Mechanical Branch, and chief of the Planning Office, as well.

Cohen earns award for executive excellence

JSC Director Aaron Cohen will receive the 1990 Executive Excellence Award for Distinguished Executive Service from the Senior Executives Association Professional Development League on Thursday.

Cohen is one of two recipients chosen from among 78 nominees on the basis of his sustained superior performance and variety of outstanding achievements, the complexity, scope and impact of his duties, his professional standards and personal integrity.

The award will be presented in a ceremony at the National Press Club in Washington, D.C., on Thursday.



NASA Photo

This image, taken by the Diffuse Infrared Background Experiment, presents a new view of the Milky Way galaxy. Another instrument on the Cosmic Background Explorer now has mapped the nitrogen, dust, carbon and carbon monoxide between the stars.

COBE maps space between stars

For the first time, astronomers have mapped the distribution of nitrogen throughout our galaxy. The new observations were taken by the Far Infrared Absolute Spectrophotometer, an instrument on NASA's Cosmic Background Explorer.

This all-sky survey, along with additional maps of carbon and dust, provides information that may enable scientists to better understand the heating and cooling processes that take place throughout the Milky Way.

Members of the COBE science team reported their accomplishments this week at the American Astronomical Society meeting in Philadelphia.

"Before COBE, it was not possible to map the whole galaxy in this way, although these atomic emissions are the dominant way in which the interstellar gas cools," said COBE Project Scientist Dr. John C. Mather, who added that COBE's unique capabilities permit these all-sky measurements unencumbered by atmospheric and instrument emission.

The new data show that carbon and nitrogen atoms—some of the key building blocks of life—are extremely widespread in the thin gas that fills the space between the stars. These atoms are created inside stars by nuclear reactions and then released back into space by stellar winds or explosions at the ends of stellar lives.

The information also confirms theories that the mixture of gas and dust in our galaxy is heated by starlight striking dust grains and cooled by the carbon and nitrogen emissions. The greatest concentrations of the atoms and dust grains are in the plane of the galaxy.

COBE scientists presented images that show the locations in the galaxy of ionized (electrically charged) nitrogen. The emission from ionized nitrogen atoms was found to occur at a precise wavelength of 205.3 micrometers. Five months of data were used to produce the maps.

The exact determination of the nitrogen wavelength is important because it will enable astronomers to build future instruments to map this radiation with greater spatial resolution.

The COBE data also were used to measure the total energy emitted by the dust, neutral carbon atoms and carbon monoxide molecules in the interstellar gas, showing that our galaxy is a typical spiral galaxy.

COBE was launched from Vandenberg Air Force Base, Calif., Nov. 18, 1989, to study the diffuse microwave and infrared light coming from the "big bang" at what is believed to be the beginning of the currently observable universe and from the first objects that formed after this primordial explosion.

Contract adds extended duration for *Columbia*

By Pam Alloway

NASA has modified its space shuttle orbiter production contract with Rockwell International Corp., Space Systems Division in Downey, Calif., to include modifications to accommodate long duration space flights on *Columbia*.

The negotiated amount of the modification is $93.5 million. The current negotiated value of the Rockwell contract is $5.6 billion and is a cost-plus-fixed-fee/award-fee contract.

Work on *Columbia's* modifications will take place at Rockwell's Downey and Palmdale, Calif., facilities, and various vendors' facilities. The modifications are to be completed by April 1992 according to the contract terms.

Rockwell will modify *Columbia* to extend the mission duration of flights from 10 days to 16 days, plus a two-day contingency. The orbiter's life support systems are dependent on mission duration and the number of crew members.

Environmental control and life support system modifications required to accommodate longer missions include a regenerative carbon dioxide removal system, improved waste collection provisions and added gaseous nitrogen and crew stowage provisions.

Additional power to extend the mission duration to 16 days is furnished by an Extended Duration Orbiter cryogenic pallet which holds spherical tanks of liquid hydrogen and liquid oxygen and is installed in the orbiter payload bay. The cryogenic pallet is being developed by Rockwell as a commercial venture.

JAIPCC issues call for abstracts

A call for abstracts has been issued for the annual Joint Applications in Instrumentation Process and Computer Control Symposium at the University of Houston-Clear Lake.

The Galveston Bay Section of the Institute of Electrical and Electronic Engineers, the Houston-Galveston Section of the Instrument Society of America and UH-CL are sponsoring the March 21 symposium.

Written abstracts of about 250 words are due by the close of business Feb. 1. Abstracts, with a completed form FF427, should be sent to Dr. Yashvant Jani, LinCom Corp., 1020 Bay Area Blvd., No. 200, Houston, 77058. Anyone with questions may call Jani at 488-5700.

The symposium theme will be "Cost Reduction in Operations." Symposium registration should be sent to Bill Weber, Lockheed Engineering and Science Co. 2400 NASA Road 1, Code B-18, Houston, 77058. For more information, call program chair Sandy Griffin at 283-5892.

Iraq hostilities force precautions

(Continued from Page 1)

Beginning Thursday, visitors were restricted to the Bldg. 2 Visitor Center, the Bldg. 3 cafeteria and Rocket Park. Visitors will not be permitted to drive or walk to other buildings.

Bldg. 9A-B, which houses space station and space shuttle mock-ups; Bldg. 30, the Mission Control Center; and Bldg. 31A, the Lunar Sample Bldg., will be closed to the public until circumstances permit them to be reopened.

Weekday visitors will be required to park their vehicles in the Rocket Park parking lot. On weekends, parking will be permitted in the lot just south of the Visitor Center.

At Ellington Field, security guards are stopping all vehicles at the two entry gates and requiring everyone to show their NASA badges. Shafer said the move is designed to restrict access to the flight line and make NASA's security procedures consistent with the precautions being taken by the Air National Guard and Continental Airlines security systems.

Truly implements more recommendations

(Continued from Page 1)

recommendations to conduct the Mission to Planet Earth as a "constantly evolving program," reestablish research and development of government environmental satellites, develop an agencywide technology plan and make certain that organizational changes are consistent with the committee's advice.

"These efforts will provide us with the solid foundation of information needed to make well-informed decisions in order to implement other advisory committee recommendations, all of which we take very seriously," Truly said.

Truly has said that, overall, the advisory committee's report is very constructive and supportive of NASA. Many of its recommendations are consistent with initiatives already under way at the agency.

Space News Roundup

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

Editor .....Kelly Humphries
Associate Editors ....Pam Alloway
Kari Fluegel

Bldg. 45 closes briefly

Bldg. 45 will be closed to everyone but emergency personnel over the holiday weekend while asbestos abatement measures are taken in the lobby.

Access to Bldg. 45 will be restricted beginning at 6 p.m. today, and will continue through 6 a.m. Tuesday.

Anyone requiring access during that period must notify the security dispatcher at x34658.

Elevators in Bldg. 45 will be operational only on floors 2 through 7 since asbestos abatement activities will block the first floor elevator.

Projector should be in use by STS-48

(Continued from Page 1)

eliminate the need for a full-time projector operator and should significantly decrease maintenance costs over the long haul, he said.

Flight Dynamics Officers and their support staffs will be primarily responsible for the new system's operation. The new system will run automatically after being loaded with data from Shuttle Data Reconfiguration System computer tapes and modified by reconfiguration support personnel. Reconfiguration technicians will no longer need to create the maps and artwork of little shuttles and satellites for the projector, Skudlarek said.

The new projector at first will merely replicate the current projector's capabilities, but is capable of enhancement through software changes.

"This system can be upgraded as new technology comes on line," said Adrianne Blume, the MCC projects engineer for the new projector. "It could provide new capabilities that haven't been fully explored yet."

The new projector is for use solely on the 10-by-20-foot screen, but the technology can be used to upgrade the 10-by-10-foot side screens in the future, she said.

Blume said the new projector will be available for use during simulations for STS-37 and other upcoming missions, but probably won't make its actual mission debut until STS-48 in November. In the meantime, the old projector will be used for missions as technicians integrate the system and flight controllers test and learn to use it.

Installation of the new projector for FCR 2 should begin Jan. 25, she said.

Skudlarek and Blume, a Rockwell Space Operations Co. employee, said teamwork has been the hallmark of the project. Flight Dynamics Officers Greg Oliver and Matt Abbott, Space Transportation System Operations Contract employees George Hayden and Joe Barath, and Loral software designer Karla Arthur all have been instrumental, they said.

When the old projector is decommissioned, it will likely be stored with the old screens, which may be used for a replica of the original control room since the MCC has been designated a historical resource.

Desert Storm addresses listed

(Continued from Page 1)

Stephanie Wells, 68 MAS/DOP, Kelly AFB, TX, 78241;

Nina Kohler, 433 MAW, 68 MAS/DOE, Kelly AFB, TX 78241;

John Breitenbach, 349 MAW, 708 MAS, Travis AFB, CA, 95535-6004;

Maj. Michael P. Stewart, 7th Support Group, 273rd Medical Detachment, Operation Desert Storm, APO New York, 09749; and

Ted LaRochelle, 439th USAF Clinic, Westover AFB , MA 01022;

Rod Etchberger, USCENTAF FWD, HQ/SG AECC, APO New York, NY, 09852.

Also, an ILC Space Systems employee, H.S. Ream, is accepting donations for overseas soldiers in general. Anyone wishing to make a donation should call 488-1044 for the location of the drop-off point.

Items such as toothbrushes and paste, music tapes, paperback books, board games, footballs, baseballs and gloves, thermal underwear, hard candy, crackers, fruit rolls or dried fruit are being sought, he said.