



JSC scientists are developing a new device for growing human tissue that's helping medical researchers on Earth. Story on Page 3.



Employees and their families will be allowed to visit the Mission Control viewing room at times during STS-44. Story on Page 4.

Space News Roundup

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Cohen supports roles, missions report

Predicts adoption of most Thompson recommendations

By Kelly Humphries

JSC Director Aaron Cohen says he believes most of J.R. Thompson's recommendations on NASA's roles and missions are good for the agency and will be adopted.

And what's good for the agency, he says, is good for JSC.

"The thrust of the study is to make the agency better and I think it will," Cohen said this week.

"According to what Admiral Truly said, I think he intends to implement the majority of the items. I think he's going to put them into three categories by the first of the year. One category would be actions he's definitely going to take, one will be actions that need more study and the other will be things he's not going to do. I don't know which ones fall

in what category, but I tend to think most of them will fall in the first category."



Cohen

Some of the recommendations could begin to be implemented as early as January, he said.

One of the most important proposals in Thompson's study, he said, calls for a return to the lead center concept that was abandoned following the *Challenger* accident. For JSC, that would mean a lead role in both shuttle and space station operations and recognition as the center of excellence for life sciences research. It also means JSC would be the lead center for Space Station *Freedom* through its man-tended phase and for the Space Exploration Initiative.

Under the plan, Cohen said, some JSC civil servants

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Sunday set as *Atlantis*' launch date

By James Hartsfield

The countdown clock for *Atlantis* and STS-44 began ticking a second time Thursday toward a 5:31 p.m. CST Sunday launch following replacement of a guidance unit on the Defense Support Program satellite's booster stage.

The first countdown was halted early Tuesday when one of five redundant inertial measurement units on the DSP's inertial upper stage showed errant readings. Launch Director Bob Steck scrubbed the launch after the gyroscope and accelerometer in one of the units failed internal tests.

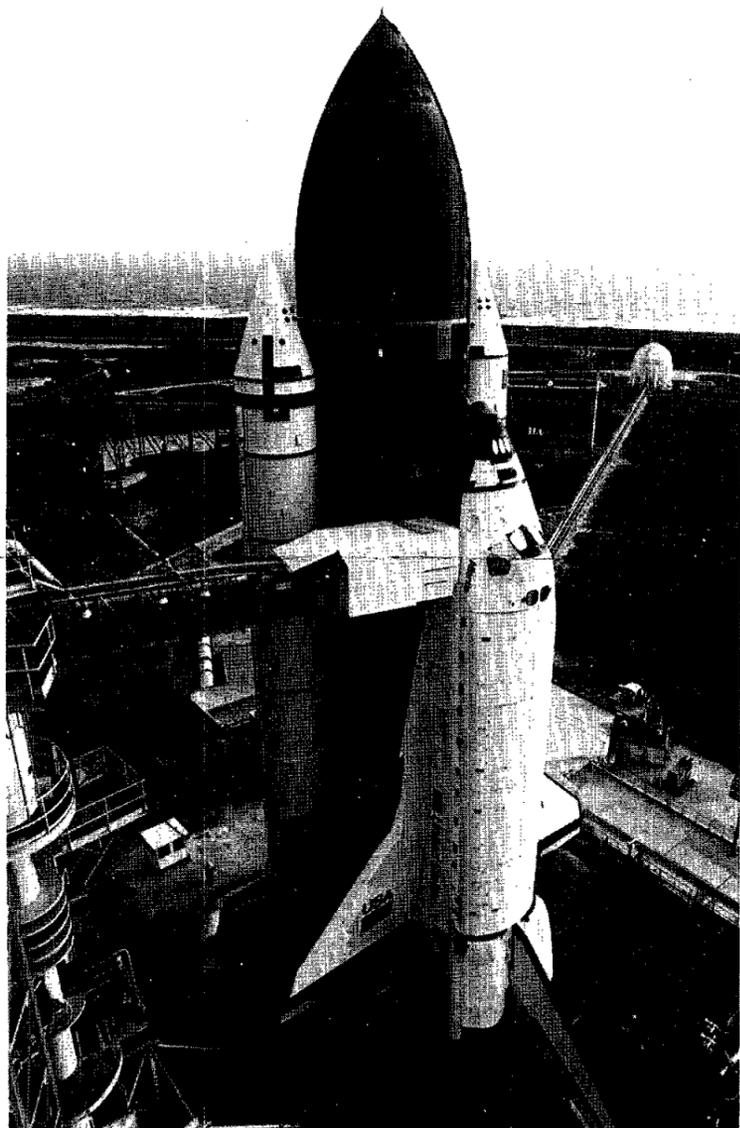
The RIMUs are navigation platforms that provide the IUS booster with information on its speed, direction and orientation. All five units must be operating for launch.

Technicians removed and replaced the faulty unit Wednesday and Thursday.

STS-44 Commander Fred Gregory, Pilot Tom Henricks, Mission Specialists Story Musgrave, Mario Runco and Jim Voss, and Payload Specialist Tom Hennen returned to Houston Thursday for an additional launch simulation and were to fly back to KSC today.

With a launch at the beginning of the two and a half-hour launch window Sunday, *Atlantis* would land

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NASA Photo

Atlantis is poised atop the mobile launcher platform on Launch Pad 39A. Tuesday's planned launch was rescheduled for 5:31 p.m. CST Sunday after an inertial measurement unit on the Defense Support Program satellite's booster failed internal tests. The IMU was replaced this week.

Combined Federal Campaign raises almost half a million

JSC employees donated \$420,967 to this year's Combined Federal Campaign, boosting the grand total to 109 percent of the \$385,000 goal.

All but eight organizations gave more than 100 percent of their 1991 goals, and two gave more than 99 percent.

Employees contributed \$44,903 more than they had in 1990, including 389 employees who gave one hour's pay per month, 13 who gave two hours' pay per month and 143 who gave over \$500.

A total of 2,839 out of 3,667 civil service employees participated. The Office of the Director, Equal Opportunity Programs Office, Legal Office and Space Shuttle Operations Integration Office all reported 100 percent or more participation.

"We have a lot of very good contributors who realize that there are

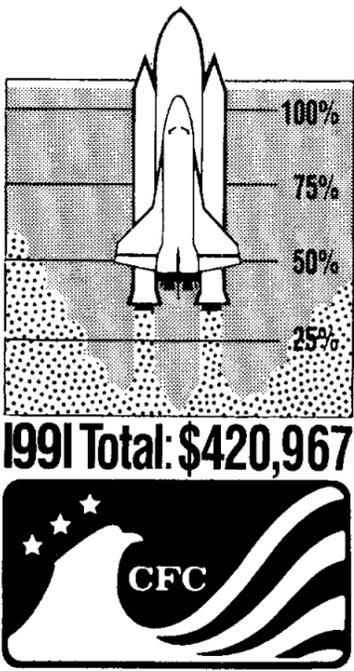
many Houstonians that need help, and they've done their part to alleviate some of that need," said CFC Coordinator Teresa Sullivan.

"We also have a lot of campaign coordinators who did an outstanding job canvassing their fellow employees," she said. "The success of this campaign could not have been accomplished without their help."

The offices that topped their goals by the most were the Equal Opportunity Programs Office, with \$1,742 or 290 percent of its goal, the Human Resources Office, with \$9,185 or 273 percent of its goal, and the Office of the Director with \$4,566 or 157 percent of its goal.

The Engineering Directorate contributed the largest dollar amount, with \$103,170 or 116 percent of its goal. The Mission Operations Directorate

Please see **CFC**, Page 4



Revised Science & Management Roles of NASA Centers

	ARC	GSFC	JPL	JSC	KSC	LaRC	LeRC	MSFC	SSC
Astronomy & Astrophys.	☆●	★●	★●					★●	
Solar System Exploration	☆●	☆●	★●	★●		⊗		⊗	
Space Physics	⊗	★●	★●					☆●	
Earth Sciences	☆○	★●	★●			☆●		★●	⊗
Life Sciences	★●		☆⊗	★●	★●				⊗
Microgravity Sciences			★●	★●		⊗	★●	★●	

● Major or Unique Science Role ★ Major Flight Project Management Role
 ○ Shared Science Role ☆ Instrument Development or Unique Facility Role
 ○ Minor Science Role

Roles, missions report endorses lead center plan

By Kelly Humphries

NASA Administrator Richard Truly says he will carefully consider an internal report on roles and responsibilities within the agency.

The report, submitted to Truly by outgoing Deputy Administrator J.R. Thompson on Nov. 8, represents the first comprehensive look at NASA roles and responsibilities in more than a decade.

Thompson's report focused on three areas: building on NASA field organizations as "centers of excellence" in specific areas of science, technology and development; sticking to the basics in engineering disciplines and program management; and realigning certain Headquarters responsibilities for more efficient program execution.

"I intend to give these recommendations careful consideration as we continue to make NASA an even better agency," Truly said.

JSC Director Aaron Cohen says the recommendations would allow space program management decisions to be made at the center level and make JSC the lead center for lunar and Mars Exploration, retaining its strength in mission operations for both the space shuttle and the space station and continuing its research into the effects of long-duration space flight

on the human body.

"I think this is good for the agency because the agency has to be able to do things better," Cohen said. "It's really going to benefit all the centers, not just JSC."

In his report, Thompson said he used a "snapshot" of NASA five to 10 years in the future to develop recommendations that would economize without reducing the scope of the agency's efforts.

"Even with sometimes frequent criticism, internally and externally, of NASA's scope, coupled with frustration by our current tight budget environment, I would not recommend a retrenchment in the range of NASA activities," he wrote. "Sharper focus within NASA and a more disciplined selection of project assignments would eliminate inefficient duplications and better achieve the desired balance between program content and available resources."

Thompson proposed a sharper focus in technology and development and in science through the nurturing of "centers of excellence" at NASA's nine centers. The way to do this, he said, is to elevate the visibility and strategic planning within each center to reflect this focus and to stop redundant work at multiple centers.

Please see **ROLES**, Page 4



Thompson



NASA Photo

GASGRA IMAGE — The first image of asteroid 951 Gaspra, snapped by Galileo on Oct. 29 from a distance of 10,000 miles, was nursed back to Earth through Galileo's low gain antenna. Flight controllers are still trying to open the probe's balky high-gain antenna.

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.

Dickens on the Strand (Dec. 7-8, Galveston): adult, \$4; child (6-12) or senior citizens, \$2.

General Cinema (valid for one year): \$4.

AMC Theater (valid until May 1992): \$3.75.

Loews Theater (valid for one year): \$4.

Astroworld Holiday in the Park (Nov. 29, 30, Dec. 1, 6-8, 13-23, 26-31): \$5.50.

JSC

Gilruth Center News

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

Defensive driving — Course is offered from 8 a.m.-5 p.m. Jan. 11. Cost is \$19.

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

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

Weight safety — Required course for employees wishing to use the Gilruth weight room. The next class will be from 8-9:30 p.m. Nov. 21 and Dec. 11. Cost is \$5; preregistration required.

Aikido — Martial arts class meets Tuesdays 6:30-7:30 p.m. and Fridays 5:15-6:15 p.m. Next class starts Jan. 7. Cost is \$35 per month.

Winter basketball — Sign-ups for the Winter Basketball Leagues will be Dec. 11-12. Monday, Tuesday and Thursday Men's C league will sign up at 7 a.m. Dec. 11. Men's A and B league will sign up at 7 a.m. Dec. 12.

Winter volleyball — Sign-ups for the mixed C Winter Volleyball League will be at 7 a.m. Dec. 4. Sign-ups for the men's, women's and mixed B league will be at 7 a.m. Dec. 5.

3-on-3 basketball tournament — Tournament will be played Dec. 2-4. Registration deadline is 7 p.m. Nov. 25. Entry fee is \$25.

Volleyball tournament — Stocking Stocker tournament will be played Dec. 5-6. Registration deadline is 7 p.m. Nov. 26. Entry fee is \$70.

Basketball tournament — JSC Fall Classic 5-on-5 basketball tournament will be played Dec. 10-12. Registration deadline is 7 p.m. Dec. 2. Entry fee is \$80.

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

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Dates & Data

Today

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

Monday

Cafeteria menu — Special: meat sauce and spaghetti. Entrees: franks and sauerkraut, sweet and sour pork chop with fried rice, potato baked chicken. Soup: cream of potato. Vegetables: French beans, buttered squash, lima beans.

Tuesday

BAPCO meets — The Bay Area PC Organization will meet at 7:30 p.m. Nov. 26 at the League City Bank & Trust. For more information call Earl Rubenstein at 483-4807 or Tom Kelly at 996-5019.

Cafeteria menu — Special: smothered steak with dressing. Entrees: beef stew, liver and onions, shrimp Creole. Soup: navy bean. Vegetables: buttered corn, rice, cabbage, peas.

Wednesday

Cafeteria menu — Special: salmon croquette. Entrees: roast beef, baked perch, chicken pan pie. Soup: seafood gumbo. Vegetables: mustard greens, Italian green beans, sliced beets.

Thursday

Thanksgiving Day — Most JSC offices, except those involved in mission support, will be closed in observance of the Thanksgiving Day holiday.

Nov. 29

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

Dec. 2

Cafeteria menu — Special: hamburger steak. Entrees: beef Burgundy over noodles, fried chicken. Soup: cream of chicken. Vegetables: buttered corn, carrots, green beans.

Dec. 3

Technology 2001 — NASA will host Technology 2001, the second national technology transfer conference and exposition, Dec 3-5 in the San Jose (Calif.) Convention Center. For more information contact Joseph Pramberger at 212-490-3999.

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

Dec. 4

National Management Association meeting — The NASA/JSC chapter of the National Management Association will meet Dec. 4 in the Gilruth Center ballroom. Social hour will begin at 5:30 p.m. followed by the featured program "Strategic Planning Panel" at 6:30 p.m. Panel members will include: JSC Director Aaron Cohen; Deputy Director of Mission Operations John O'Neill; Deputy Director of Engineering Max Engert; Deputy Manager of the Space Station

Projects Office Carl Shelley; and Manager of Planning and Control in the New Initiatives Office Lyn Gordon-Winkler. The panel moderator will be JSC Associate Director Daniel Nebrig. Reservations should be made by noon Nov. 26.

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

Dec. 5

College registration — On-site registration for classes at the University of Houston-University Park will be from 10:30 a.m.-2 p.m. Dec. 5 in the lobby of Bldg. 45. For more information, call Beth Hall, x33078.

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

Dec. 6

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

Dec. 10

Women's holiday party — A JSC women's holiday party will be held Dec. 10 in the Gilruth Center ballroom. A cash bar will open at 4:30 p.m. with a hors d'oeuvre buffet at 5:30 p.m. The program will begin at 6:30 p.m. For additional information contact Donna Coenen x33081.

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or Fax ads accepted.

Property

Sale: Lots, 125' X 25'/ea, five in a row, sell individually or together, no util. city water, sewer, gas, elec, owner finance, \$2.5K/ea. 339-1337.

Sale: La Porte, 2 story 3-2.5-1, lg corner lot, assume \$506/mo, \$10K equity, 474-2660.

Lease: 3-2-2, near I 45 and Fuqua exit, remodeled, \$595/mo. Minh 333-6806 or Oanh, 484-2456.

Sale: House 5-2.5-2, 8.5% FHA assum. 488-3191.

Lease: El Dorado Trace, 1-1.3-1CP, study, full sz W/D, alarm system, \$450/mo. Scott, x39376 or Marcie, x31886.

Lease: Bay Glen, new, 2 story, 4-2.5, gas heat, fans, FPL, whirlpool, garage door opener, fenced. Dennis C., 282-5273 or 480-5361.

Rent: Lake Tahoe condo, near Heavenly Valley ski lift, furnished, accom 6, 16-23 March 1992, \$420, 474-5610.

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

Lease: New Heritage Park, 3-2-2, FPL, formal, high ceiling, garage door opener, patio, \$775/mo, plus dep. 486-5527.

Sale: Near Livingston, 40 plus acres, spring fed creek, stocked fish pond, two houses. (409) 563-4079.

Sale: Friendswood, 2 lots, 0.95 acre, all util, no flooding, \$32K and \$39K, both \$59K. Ron, 996-9724.

Sale/Trade: Condo on 1 acre lot w/sking, sell or trade for travel trlr. 488-7090.

Lease: Friendswood, Wedgewood Village, 3-2-2, FPL, lg fenced yard, carpet, formals, 1.7K sq ft, avail 11-20-91. \$750/mo; Friendswood, Wedgewood Village, 3-2-5-2, FPL, lg fenced yard, carpet, w/br, formals, 1.8K sq ft, avail 1-1-92. \$850/mo. 482-6744.

Rent: Galveston condo, furnished, sleeps 6, pools, cable TV, wknd/wkly/daily. Magdi Yassa, 333-4760 or 486-0788.

Rent: CL Middlebrook II, 3-2-2, 1940 sq ft, FPL, fence, garage opener, avail Dec 1, \$850/mo plus dep, no pets. x30686 or 480-3260.

Sale: LC, Countryside, 2 story, 3-2.5-2A, lg fenced yard, covered wood deck, interior util rm, BRs upstairs, new water heater/dishwasher, new paint/wallpaper, parks and pool, by owner w/no approv assum, \$15K down, \$692/mo. 554-7623.

Sale: LC, The Landing, 3-2-1, \$58K. x31096 or 486-5103.

Rent: Arkansas lake cabin, furnished w/antiques, screened porch, accom/8, \$250/wk, \$50/day. 338-2517.

Lease: Pearland, Springfield, 3-2-2A, open floor plan, no pets, alarm sys, \$1K/mo. 929-7208 or 489-9337.

Lease: Barringer Way 4Plex apt, 2nd floor, 2-1, W/D conn, pool, storage area, ex cond, no pets, pay bills, avail 12-16-91, \$425/mo. 486-2048.

Rent: BayWind II condo, 1-1, W/D, refrig w/ice maker, microwave, new paint/carpet/dishwasher, near pool, \$440/mo. Steve, 244-7474 or 486-8048.

Cars & Trucks

'74 BMW 2002, 4 spd, green w/tan int, new tires, new \$2K paint job, sunroof, AM/FM/cass, ex cond, \$8K OBO. David, x32791 or 488-9768.

'85 VW Jetta diesel, 4 dr, 5 spd, dark metallic gray, sunroof, BO, 282-3478 or 338-1976.

'76 Ford Elite, ex cond, \$1.5K. x33678 or 489-7494.

'87 Dodge Ram 50 PU, 55K mi, A/C, good cond, \$4.2K. Ken, 388-1504.

'84 Subaru, all power, runs, needs work, \$575. 473-4148.

'76 Cadillac Coupe de Ville, 500 cc, silver, leather

int, clear title, 64K mi, \$1.8K OBO. (409) 938-4793.

'91 Mitsubishi Eclipse, 16V DOHC, loaded w/alarm, wht, \$10.7K. Steve, 960-3990 or 890-7755.

'87 BMW 325 conv, gray, 33K mi, hard top, ex cond, ext warr, \$20K. 332-5580.

'77 Jaguar XJS, 12 cyl, 60K mi, good cond, \$8.9K. 282-5325 or 488-8493.

'78 Chevy Malibu wagon, 305 V8, 62K mi, int ex cond, \$1695. x35180 or 326-3706.

'79 Plymouth, 6 cyl, 2 dr, A/C, good cond, \$550. x34339 or 481-1439.

'83 Mazda 626 LX, light blue, loaded, good cond, BO. 471-1552.

'71 MGB-GT, blue, ex cond, new restored seats, AM/FM, rebuilt 67 engine, moon roof, \$3790 OBO. 283-4322 or 334-5114.

'90 Chevy Cheyenne extended cab, 350 V8, 19K mi, 5 spd/OAD, loaded, \$10.9K. 282-3215 or 480-9448.

'71 Triumph TR6, ex cond, new tires, \$5.8K. Steve, x38068 or 532-1949.

'88 Ford Mustang LX convertible, loaded, auto, P/W, P/L, cruise, tilt, leather int, 52K mi, \$7.8K. Chad, 486-6125.

'80-1/2 Ford Escort GT, ex cond, low mi, \$7.5K. Phil, 280-2239 or 333-1017.

'69 Ford LTD, 390 eng, rebuilt trans, new tires, brakes, \$1.2K. 554-2879.

'74 VW Super Beetle conv, yellow w/bk top, \$3.5K. Rich, 283-5820 or Glenda, x36748.

'84 Mercury Cougar, P/S, P/S, cruise, \$1.7K. 337-2452.

'81 Honda Accord, good cond, needs work, 5 spd, new tires/front end/muffler, 112K mi, avail 12/19, \$900 OBO. x35167 or 332-2245.

'79 Olds Cutlass wagon, good cond, A/C, 97K mi, \$1450. 280-9479.

'90 Ford Aerostar XLT, low mi, loaded, ex cond, 6yr/60K mi warr. Chris, 280-4407 or 334-1915.

'89 Chevy S10 Blazer, 4.3L V6, 4WD, dark blue, A/C, AT, P/W, P/L, ABS, Tahoe pkg, 39K mi, \$9.9K. x38794 or 286-9075.

'86 Pontiac Gran Am 4 dr, records, manuals, 95K mi, ex cond, \$3850. 326-3370.

'84 Mazda 626LX, 2 dr, 5 spd, man, all/pwr, good cond, \$3.2K OBO. Dave, x38120 or 488-5496.

'84 Chevy Cavalier Type 10, Red, hatchback, AM/FM/cass, 85K mi, \$2.5K OBO. Sharon, x32213 or 487-6436.

'78 Buick Riviera 75th Anniv car, 403 V8, blk/gray, good cond, \$1695. x35180 or 326-3706.

'78 Olds Cutlass Cruiser, good cond, new batt, service manual, extra full sz tires, \$1.2K OBO. 488-5329.

'87 Toyota Supra, wht/blue, 57K mi, ex cond, \$9950. Time, x34333 or 486-0534.

Cycles

Honda XL dirt bike, BO. 474-3768.

'88 Yamaha DT500C, 2.2K mi, ex cond, Fulmer helmet, wht/red, \$700. Scott, x39378 or Marcie, x31886.

Boats & Planes

'76 27' Catalina sailboat, 3 sails, I/B diesel, Bimini, wheel, updated int, 2 batt, depth/knot meter, \$13.5K OBO. Ken, x30921 or 333-2699.

'85 Bayliner Capri 1600, 85hp Force O/B, AM/FM/cass, galv trlr, Bimini top, boat cover, no saltwater, 60hrs on boat/eng, \$4.5K OBO. Keith, x35191 or 332-5170.

'89 Invader, 18', w/trlr, I/O Merc 130hp, SS prop radio, swim platform, storage cover, 50 hrs, \$9.2K OBO. 488-8805.

'78 36' Islander Freepoint sloop: new engine (parts, labor warranty to 3/92); new trans; new upholstery; new electronics (full warranties 1-3 yrs); new bottom; new lighting; 3 sails; 2 TVs; h/c press water; marine a/c; heat; Zodiac dinghy; EPIRB; engine spares; etc. Redone throughout. \$64,500. James, x34934 or 554-4353 after 5 p.m.

Audiovisual & Computers

386/20 clone by Missing Byte, incl VGA moni, modem, printer, SW, \$1.8K OBO. 280-1579 or 482-

5536.

286 PC, 2MB RAM, .31 dot VGA, 1.2 floppy, 84.9 SCSI HD, 101 kb/d, DOS 4.01, misc SW, \$800. 339-1337.

Pioneer PL-15D-II turntable, discwasher, record, stylus cleaners, \$35. 333-2830.

386/16 PC, VGA color, 1.2MB FD, 1.4MB FD, 2MB RAM, 387 math co-processor, HD, Dos 4.01, extra SW. John H., 280-2786 or 487-0414.

Four David Clark H10-20 headsets, ex cond, \$150/ea; Sporty's A-300 Airband transceiver w/access, \$250. 282-4666 or 482-4866.

Five CD cartridges, ea holds 6 CDs, fits most compact disc players, \$6/ea. Suzanne, 335-2896 or 527-9070.

Commodore MPS-803 printer, ex cond, 2 boxes SW plus manuals, \$75. Kathy, x36807 or 475-0975.

Two Macintosh 20MB HD, 1 external, \$135, 1 internal, \$100. 286-5506.

Adaptec HD/FD controller, \$50; 60MB HD, \$50; Managing Your Money, ver 7.0, new, \$80; Dinosaur Discovery Kit, ages 3-8, \$15. Ted, 486-4747.

Cakewalk Proffess 4.0 MIDI sequencer SW, \$150; Borland Paradox 3.5 database, \$275; Quattro Pro 3.0 spreadsheet, \$175. Martin, 244-5338 or 488-0949.

IBM PC Jr., enhanced, RGB color moni, DOS 2.1, Writing asst, \$300 OBO. 480-5329.

Sharp Lyntron 25" color TV, no remote, 4 yrs old, \$150. 2454-9802 or 998-9592.

Lost & Found

A pair of half glasses found in April during STS-110-yreunion at Gilruth Center. Mary Thomas, x35434.

Musical Instruments

Wurlitzer organ, three kybds, backup rhythm section, good cond, \$500. 532-2158.

Pearl 5 pc bk drum set, w/hardware, no cymbals, Export series, ex cond, \$375. Rommel, 282-5544.

Pets & Livestock

AKC Yorkshire Terrier puppies, 10 wks, males, 1st shots, \$300 OBO. George, x38957 or 486-6944.

Female Persians, w/breeder quality, grand champion lines, \$200-\$450; kittens: stud service, 2 blk males, top show quality. Kristy, x33418 or 286-0146.

AKC Rhodesian Ridgeback puppies, champion sire, avail now, \$350-\$600. 335-1862.

Male Rottweiler puppy, champion bloodline, 271-6633 or 723-6077.

Blue and gold Macaw, 14 wks old, talks. 337-3838.

Free Springer Spaniel, 2 yrs old, all shots. Nancy, x38522.

Household

Dark mahogany bar, wine rack, marble tops, mirrors, 2 stools, \$500. 532-2158.

Chrome mirror DR table w/chairs; Mediterranean BR set; antique daybed, \$500. J. Kinsey, 486-0421.

Kincaid BR set, 2 mos old, triple dresser, 2 night tables w/drws, traditional cherry w/brass pulls, was \$1510, now \$800. 474-2660.

Chaise longue, blk, \$275; kg sz waterbed w/12 drws, \$300. 484-7622.

Keller solid oak DR table, dbl pedestal, 48" round w/leaf, 4 high bow-back chairs, ex cond, \$1.4K. Nick, 333-7296.

Queen sz waterbed, \$100; sofa/bed and loveseat, \$200; 21 cu ft frostless refrig, \$250. Andy, x32503 or 334-2647.

Two solid oak twin bed sets, good cond, \$40. Jim, x34990 or 326-3022.

Natural rattan 3 sz sleeper sofa, recliner, 2 etageres, 2 end tables, 1 coffee table, glass tops and shelves, \$2K OBO. Phil, 326-1408.

Small wooden pedestal table w/4 chairs, \$15/ea or \$60/all. Max, x38127 or 482-7879.

Antique mahogany DR tbl, 6 chairs, china cabinet. Lee, 488-1146.

King sz motionless waterbed, \$200; loveseat, \$150; computer desk, \$65/all OBO. David, 282-3318 or 996-5598.

Wall hugger recliner, pastel green, ex cond, \$75. Marian, x39021.

Whirlpool pwr clean port dishwasher, good cond, \$150; waterbeds, ex captains drwr w/frame, \$50; 6 X 4 plant stands, rough cedar w/lights, \$50/ea. Kathy, x36807 or 475-0975.

Baby crib w/matt, \$75. 482-5226.

Three Nagels, \$50/ea; James Dean, \$100; framed and decorated blk mirror, \$75; kg sz blk lacquer bed w/matt, dressers, storage hdbd, was \$2.5K, now \$900; 2 blk/gold bar stools, \$40/ea. 334-1773.

Two LR upholstered chairs, plump pillow back, celery green, velvet, ex cond, \$100/ea or both \$175. Lissa, 282-3788 or 480-2188.

Couch, chair, ottoman, ex cond, \$200. 480-2997.

7' couch and matching chair, good cond, \$350 OBO; 2 tan recliners, good cond, \$50/ea. Joe, 996-9001 or Dave, 482-3428.

King sz oak waterbed, Superior Hibernation matt, \$275 OBO. 486-8319.

Couch and loveseat, ex cond, \$350/both OBO. 332-6509.

GE refrig, gold, 20 cu ft, ice maker, broken, use for parts, \$300 OBO. Lorr, 283-1852 or 332-9173.

King sz waterbed, 90% motionless, bookshelf hdbd, htr, padded rails, good cond, \$125. Jeff, x38424 or 331-7166.

Dinnette w/

One Giant Leap for Medicine

Device created to grow tissue in space already is helping researchers understand tumors, create new drugs on Earth

By Kari Fluegel

Technological improvements are making medical advances more and more commonplace. Still, research remains limited by the boundaries of Earth's gravity.

One boundary, that of tissue growth in the laboratory, is being pushed farther out due to work in JSC's Biotechnology Program with a system that promotes such cell culturing.

The device, called the rotating wall vessel, cultures cells in an environment that emulates how they might grow in space. The rotating wall vessel nurtures the cell cultures in a horizontal cylinder that slowly rotates, bathing the cells in nutrients and oxygen and mirroring the way they could be suspended in such a mixture in microgravity.

Tissues grown during the development and testing of the vessel already have been put to work in attempts to create drugs, grow tissue for transplantation and understand malignancies.

"The biggest problem with cell cultures grown in the laboratory is the mechanical means used to suspend them," said Glenn Spaulding, manager of JSC's Space Biotechnology Program.

In other culture devices, cells become damaged by the suspension vessel or do not bond together to create tissues. Consequently, scientists have not had high-fidelity tissue models available for their research.

Research done with the rotating wall vessel over the past two years, however, has produced cell cultures more like the human tissue, and the more similar the cells to the original tissue, the more applicable and appropriate to the intended research.

Research begins with a small seeding of starter cells from a donor or patient. Cell assemblies then begin to take form and resemble the original tissue.

The rotating wall vessel, developed as a cell culture growth tool for Space Station *Freedom*, already has pioneered research in lung tissue growth, skin growth, small intestine development, cartilage growth, colon cancer proliferation and brain tumor growth and therapeutics.

The rotating wall vessel hardware will receive its first test and equipment checkout in space during STS-44. Flown as Detailed Supplementary Objective 316, the vessel hardware will be used in a test that researchers hope will confirm their theories and calculations about how the flow fields work in space, thus validating the fluid dynamics of the device in the absence of living cells.

Plastic beads of various sizes rather than cell cultures are being flown in the vessel for the STS-44 test.

Video of bead movement will be collected for postflight analysis to refine the system. Plans are to fly cell cultures on future shuttle missions and Space Station *Freedom*.

By emulating the space environment, the vessel allows tissue cultures to grow for a longer time than previously was possible.

"The longer certain cells grow, the larger and more well-developed they become, the more meaningful the medical application," Spaulding said.

The rotating wall vessel, however, may not speed the growth process. What takes months to generate within the body, would take months within the vessel.

Spaulding attributes the development of the rotating wall vessel to serendipity or to having the right people in the right place at the right time.

About two years ago, researchers who were developing a plan to grow tissue cultures in space were trying to solve the question of how to suspend the cells for the experiment, he said. The primary problem was stowing the suspension vessel in a middeck locker that would shift its orientation during ascent, orbit and entry to the extent that the tissue would be damaged.

Then, with the help of a power drill and a

small jar of beads, investigators Tinh Trinh and David Wolfe gave birth to the concept of keeping the culture delicately suspended by maintaining it in a state of continual motion. The first vessel was built by Ray Schwartz and the hardware for the DSO was developed and constructed in nine months, Spaulding said.

"If it weren't for the teamwork and the Apollo-like spirit of this group, medical science would not have had this tool," Spaulding said.

Other team members include David Tsao,

who is managing the DSO activities, and Tom Goodwin of Krug Life Sciences, who coordinated the cell science, Spaulding said.

Even though the rotating wall vessel greatly improves upon

the older classical methods of tissue culturing on Earth, gravity still plays a role in the culture process. As the tissue becomes larger, it settles to the bottom of the growth chamber and is damaged.

Cells can be grown successfully on Earth in the rotating wall vessel for about three months. Following that, the cultures themselves are too big to combat the pull of gravity. They drop to the bottom and become damaged.

Plans call for cultures to be grown on the Earth for the first three months, then flown in space where gravitational effects are miniscule for the remainder of their development.

Though never tested with tissue cultures in space, where its full potential can be realized, the rotating wall vessel already has made important strides in medical research.

"We're using NASA's rotating wall vessel to study the interaction between the human colon fibroblast stromal support cells and human colon cancers because we feel that — by being able to study phenomenon in this vessel — we may gain a unique insight into the cellular

interaction and how this relates to the progressive growth of tumor in patients," said Dr. John Jessup of the Harvard Medical School's Laboratory of Cancer Biology.

Jessup is one of many investigators already using the rotating wall vessel technology. His research focuses on understanding how colon tissue develops and why malignancies develop in certain patients.

"In this vessel, we're able to re-create a three-dimensional culture that is very difficult to do in any other tissue culture apparatus," he said. "Most tissue culture systems are gravity-limited to two-dimensional cultures. By lacking the third dimension of vertical growth, it's very difficult to be able to study what happens when cells are growing around one another."

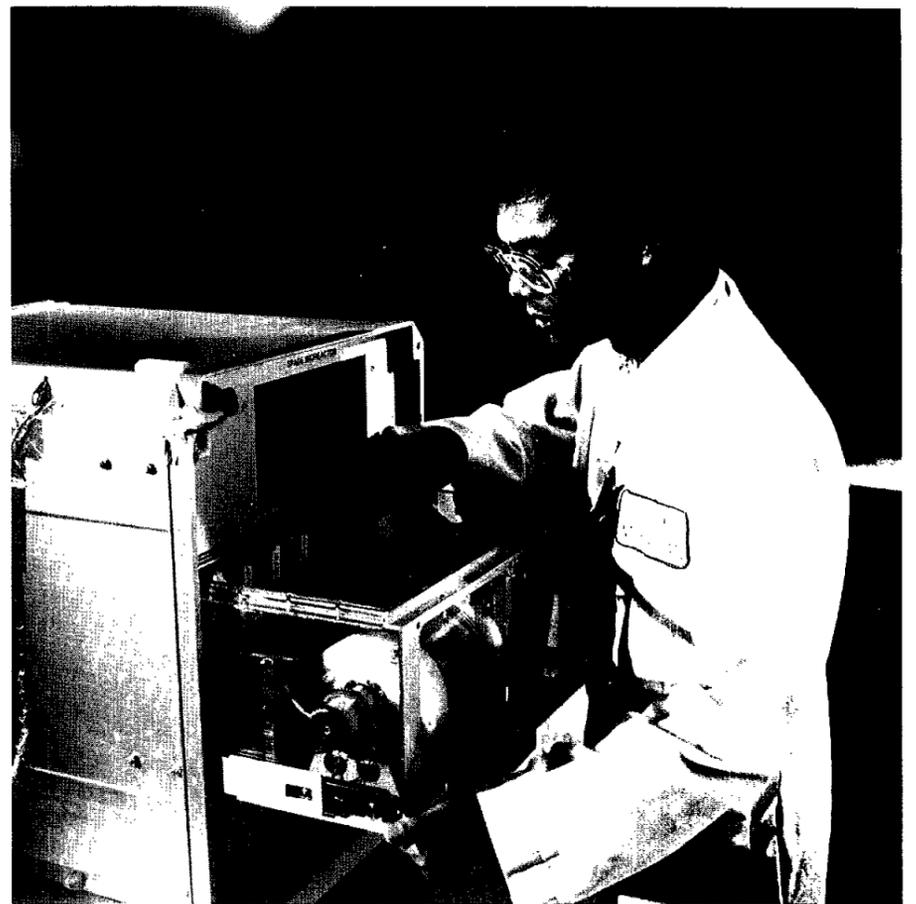
A research group at the University of Texas Medical School has successfully grown a virus responsible for high infant mortality in Third World countries and is now laying the foundation for vaccine development. Still another at the Huntington Medical Research Institute in Pasadena, Calif., is using the rotating wall vessel to develop better methods of treating malignant brain tumors, which are 100 percent fatal.

"This will be a sterling collaborative effort because we very much want to call on the expertise of the JSC scientists and engineers who have developed this whole technology," said Dr. Marylou Ingram, senior research scientist at the Huntington Medical Research Institute.

"We will be studying the tumors that we get from our patients and our aim is to as soon as possible be able to produce tumor-sensitized lymphocytes which we may be able to use in the treatment of our patients."

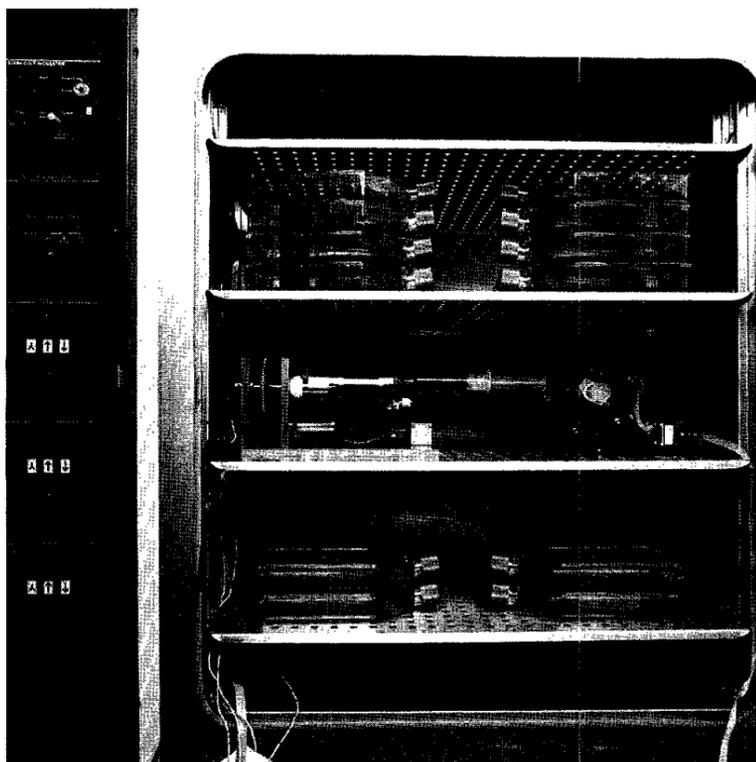
Access to the microgravity environment of space, as will be available on Space Station *Freedom*, will only enhance the research begun with the rotating wall vessel in Earth-based laboratories.

"We need microgravity for an extended time period," Spaulding said. "Without space station there would be no opportunity to exploit the potential of this fascinating and important tool."



'The longer certain cells grow, the larger and more well-developed they become, the more meaningful the medical application.'

— Glenn Spaulding,
Space Biotechnology Program manager



Top: Tinh Trinh checks out the hardware for the space bioreactor. The bioreactor will have its first microgravity test on STS-44. Left: Researchers first tested rotating wall vessels, on the second shelf, in the Bldg. 37 Biotechnology Laboratories. Since that time investigators from across the country have used the technology to further their tissue growth studies. Above: Tacey Prewett checks the progress on a bioreactor experiment. The rotating wall vessel simulates the microgravity environment in space by keeping the tissue suspended away from the walls of the vessel which could damage the growth.

Cohen says plan would put JSC on 'correct road'

(Continued from Page 1)

probably would move to Kennedy Space Center, which would become the lead center for the space shuttle, but JSC would keep responsibility and the workers needed for space shuttle sustaining engineering.

JSC also would gain some space station employees from elsewhere in the agency. "It's too early to say how many," he said. "If Admiral Truly implements the lead center concept for shuttle to go to KSC, there would be some movement to the Cape. I think it might be in the 20- to 40-person range, civil servants only.

"If the space station implementation takes place, then that would mean some movement of people to the Johnson Space Center, civil servants and contractors. I really don't know how many."

Cohen said shifting shuttle program management to KSC and splitting space station work — giving JSC the lead in its man-tended stage and Marshall Space Flight Center the lead in its permanently manned configuration — make sense.

"In the big picture or in the long term, it says that the role for JSC in shuttle is really taking the correct

road: mission operations, crew training and sustaining engineering. But a lot of the program management activities are being moved to the Kennedy Space Center. For space station, coming along right after that, we have a big development job and operations job. And once the development job is phased out, we have a long-term exploration program. So we have a good phase-in of operations and development and when one development program is over, another one takes its place.

"It is going to be well-phased, allowing us to build our people, build

our strengths, build our capabilities, but not be something that's piled on all at once."

Cohen said JSC's designation as a center of excellence for life science research would help eliminate some overlap and duplication, a necessity if JSC is to carry out the role of lead center for a man-tended space station and lunar and Mars exploration.

"We are definitely going to continue the research here on how humans operate in space," he said. "It's made a little cleaner demarcation."

Cohen said Thompson's proposal falls "remarkably close" to what JSC

managers have adopted as a Strategic Game Plan, and with the tenets of Total Quality Management. It calls for continuous improvement in the right directions that will give NASA and JSC an opportunity to become more efficient and thus be able to accomplish their ambitious goals.

"I think J.R. did an outstanding, very thoughtful job," Cohen said. "J.R.'s intent was to allow the projects to start to make the decisions rather than having to elevate everything to the program or Headquarters level. That is getting back to the lead center concept. I agree with that."

Mission Control viewing room open for visits

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of the STS-44 mission.

Based on a Sunday evening launch, employees will be allowed to visit the MCC from 11:30 a.m.-2:30 p.m. and 5-7 p.m. Monday, 11:30 a.m.-2:30 p.m. Tuesday, 11:30-2:30 p.m. and 5-7 p.m. Wednesday, 1-4 p.m. Thursday, 11:30 a.m.-2:30 p.m. Friday, 1-4 p.m. Saturday and Sunday, 11:30 a.m.-2:30 p.m. and 5-7 p.m. Dec. 2, and 11:30 a.m.-2:30 p.m. Dec. 3.

Employees must wear their badges and escort family members through the regular public entrance on the northeast side of Bldg. 30. Children under 5 will not be permitted.

The STS-44 crew return ceremony will be held at Hangar 990 at Ellington Field about nine hours after the crew lands in Florida or 9 1/2 hours after a landing in California.

Employees are encouraged to call the Employee Information Service at x36765 for the latest information.

Special cafeteria hours also have been set. The Bldg. 3 cafeteria will be open from 7 a.m.-4:30 p.m. weekdays, except the day of launch. On weekends and holidays, Bldg. 3 will be open from 11 a.m.-4:30 p.m.

The Bldg. 11 cafeteria will be open from 6:30 a.m.-2 p.m. weekdays, except the day of launch, and from 7 a.m.-10 a.m. weekends. Bldg. 11 will be closed Thanksgiving Day.

CFC results

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gave the next largest amount, \$80,029 or 123 percent of its goal.

JSC employees at the White Sands Test Facility contributed \$3,398 to the Sun Country CFC and had 80 percent participation.

John T. Sims of Mission Operations' Training Division, William G. McMullen of Engineering's Structures and Mechanics Division, Douglas S. Whitehead of the Space Shuttle Engineering Integration Office and Kevin S. Tones of Mission Operations' Reconfiguration Management Division won free airline tickets to anywhere in the United States.

Anyone who still wishes to donate should contact the JSC Exchange Operations Office at x39168.

Roles, missions report advocates cutting duplication

(Continued from Page 1)

"We have too many players and too little depth in some areas," he wrote.

In science, he proposed retaining center science involvement only when three criteria are met: a major flight project management assignment currently exists, instrument development assignments exist and unique facility capability is in place.

Thompson also proposed a return to the lead center concept for program execution, citing the Skylab, managed by Marshall Space Flight Center with JSC supporting, and the space shuttle, managed by JSC with Marshall supporting, as examples of where the concept worked well.

"I am well aware of why we changed — the *Challenger* accident — but feel that management

deficiencies that contributed to that incident can, and have, been corrected through a strong chain of command structure."

Under Thompson's plan, JSC would be the lead center for the Space Exploration Initiative and for the shuttle-tended mode of Space Station *Freedom* construction and operation. Kennedy Space Center would be the lead center for the space shuttle. Marshall would be lead for space station in its permanently manned configuration, and for the National Launch System. NASA's Jet Propulsion Laboratory would lead in planetary science, Goddard Space Flight Center in Earth science, and Langley Research Center on the National Space Plane.

He proposed no changes to the way in which NASA centers report

to Headquarters, but suggested Headquarters organizational realignments such as moving responsibility for expendable launch vehicles and upper stages from Code M to Code S, where the primary users are.

Because of the significant increase in flight opportunities with the advent of space station, long-duration shuttle flights and dedicated Spacelab missions, Thompson also suggested shifting the responsibility for life science research directly involving astronauts to Code M where it can be integrated into mainline operations. He said such research should be expanded and made a centerpiece of NASA's program.

He urged center directors and associate administrators to exercise tight control over in-house projects and keep them consistent

with the center of excellence focus. At research centers such as Langley, Lewis and Ames, he said, in-house work should be the rule. At development and science centers it should be the exception.

Thompson said that today, NASA must realign its project management priorities to put cost ahead of schedule and performance.

"Today the taxpayers' priority is cost control," he wrote.

Thompson suggested placing major emphasis on technology readiness and real requirements before starting programs, establishing a built-in mechanism to quickly terminate any program where cost projections exceed commitments made to the Administration and Congress and appointing a NASA chief financial officer to certify cost projections.



JSC Photo by Jack Jacob

FIRST MEETING — JSC's new Black Employment Council, formed last month by the Equal Opportunity Program Office, meets for the first time. The council will coordinate and plan all official activities of the Black Employment Program.

Unisys worker earns quality award

Anthony H. Lyssy of Unisys recently received the NASA Quality Partnership Award for his leadership in the company's Quality Improvement Program.

The Quality Partnership Award recognizes people outside JSC's Safety, Reliability and Quality Assurance Office who play key roles in helping JSC employees and support contractors reach a common goal of excellence. It was designed to recognize professionals who do not work in the quality field but who make significant contributions to quality.

Lyssy is the Unisys manager of the Build Management Group within the Space Transportation System Operations Contract, Simulation Applications Department.



Lyssy

Lyssy is responsible for the implementation of Total Quality Management throughout the organization, according to his nomination. He has been "the driving factor for Team 'T' becoming a true pacesetter in the quest for excellence," the nomination stated.

Lyssy's team has led the way in metrics management, continued improvements through process management and trend analysis.

The Quality Partnership Award is presented twice a year. Nominations are made by peers or managers. They should be submitted to the Quality Assurance and Engineering Division, Code ND. For more information, call the division at x34352.

Discovery being prepared for STS-42

(Continued from Page 1)

at KSC at 1:07 p.m. CST Dec. 4. The weather forecast for Sunday holds a 70 percent chance of favorable conditions for the launch.

Elsewhere at KSC this week, the International Microgravity Laboratory-1 (IML-1) was installed in *Discovery's* cargo bay in preparation for the STS-42 mission, planned for a late January 1992 launch. Also, tests were performed on

Discovery's forward reaction control system and on the orbital maneuvering system.

Main engines were installed on *Endeavour* this week in preparation for the newest orbiter's first flight next spring. Tests were conducted as well on *Endeavour's* fuel cells, mechanical arm, environmental control system, Ku-band communications, auxiliary power units and main propulsion system plumbing.

JSC changes space station hardware pact

By Pam Alloway

JSC has awarded McDonnell Douglas Space Systems Co., Huntington Beach, Calif., a modification to the contract that provides hardware components for Space Station *Freedom*.

The schedule A contract includes the preintegrated truss, mobile transporter, airlock, integrated nodes and various subsystems for space station. JSC has a separate contract with McDonnell Douglas to integrate space station components.

The negotiated cost-plus-award-fee for the modification is \$46,250,000. The majority of the work will be performed at the McDonnell Douglas facility in Houston. A significant portion of the work will be subcontracted to IBM Federal Systems Division, Houston.

The modification will encompass the integration, test and verification environment and Ada compiler.

The integration, test and verification environment will test software in its target environment, control and execute simulations during testing, and control the test environment and data analysis. This environment also will provide standards for simulation development and simulation interface requirements. These interface requirements will reflect flight systems assembly and simulation interface requirements for test execution and control.

McDonnell Douglas also will provide Ada compilers for use with the Space Station Data Management System's hardware/software environment. Under the modification, McDonnell Douglas will deliver 110 standard data processor compilers and 17 multiplexer/demultiplexer compilers, both derived from commercially available computer systems.

Women's group members named

Ten JSC employees recently were selected to serve as the 1992-93 Federal Women's Program Working Group.

The working group's primary purpose is to assist the Federal Women's Program manager in enhancing the equal opportunities for the employment, training and advancement of women at JSC.

Members serve one-year terms with the option for continuing a second year.

Working group members are Natalie Saiz, Human Resources Office; Cheryl Harrison, Space and Center Operations Procurement Division; Carla Burnett, Astronaut Office; Suzanne Larkin, Space Station Systems Division; Steve Elsner, Guidance and Control Systems Section; Irene Hackler, Systems Engineering and Integration Office; John Lu, Facility Planning Office; Shirley Randolph, Logistics Division; Lupita Garcia, Security Division; and Deborah Harm, Medical Sciences Division.

Recommendations and/or suggestions regarding the Federal Women's Program may be directed to any of the working group members or to Pam Adams, Federal Women's Program manager, at x33761.

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.

Due to the Thanksgiving and Christmas holidays, the Roundup will not be published Nov. 29 or Dec. 27.

The deadline for Dec. 6 Swap Shop ads will be 5 p.m. Wednesday, Nov. 27. The deadline for Dec. 20 Swap Shop ads will be 5 p.m. Wednesday, Dec. 11, and the deadline for Jan. 3 ads will be 5 p.m. Tuesday, Dec. 24. Items for the Jan. 3 Dates and Data calendar are due by 5 p.m. Friday, Dec. 20.

Editor Kelly Humphries
Associate Editors Pam Alloway
Kari Fluegel