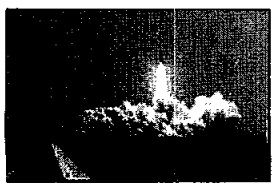
NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas



Manifest matrix

NASA's new space shuttle manifest includes 27 missions through 1993 and some payloads through 1997. Chart on Page 3.

Higher learning

Astronaut Mario Runco shows University of Houston President Marguerite Ross Barnett around the air-bearing floor. Photo on Page 4.

Space News Roundup

Vol. 29 | **December 7, 1990** | No. 48

NASA inks new Mixed Fleet Manifest

NASA issued a new Mixed Fleet Manifest on Wednesday that includes 27 shuttle flights over the next three years.

Most of the shuttle missions will carry NASA payloads or joint NASA/international payloads focusing on a variety of life sciences, materials science and astrophysics investigations.

The remainder will support two international Spacelab missions, two flights of the commercially provided Spacehab module and the retrieval and reboost of a stranded commercial communications satellite.

Seven shuttle launches are planned in 1991, eight in 1992 and 12 in 1993.

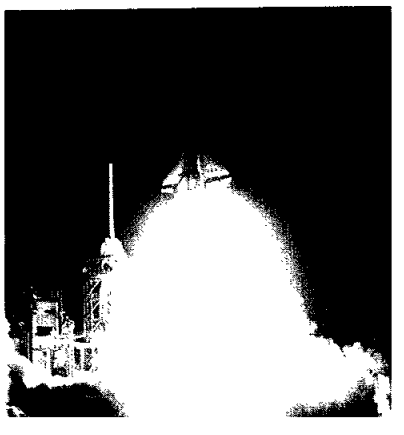
The Mixed Fleet Manifest shows 13 launches of expendable vehicles over the next three years; three launches in the small vehicle class, seven in the medium category and three in the intermediate class. Among the NASA payloads planned for launch on ELVs are the Extreme Ultraviolet Explorer and Geotail on Delta II vehicles in August 1991 and July 1992, respectively, and the Mars Observer on a Titan III in September 1992.

The first 1991 shuttle launch will be STS-39, an unclassified, dedicated Defense Department mission carrying payloads belonging to the Air Force and the Stategic Defense Initiative Organization.

NASA's Gamma Ray Observatory is planned for launch in April and the first Spacelab Life Sciences mission is planned in May. Following that flight, *Columbia* will be returned to the Rockwell International facility in Palmdale, Calif., for extensive inspection and modification to accommodate the extended duration orbiter pallet.

The primary payloads for the last four flights for 1991 are the fifth Tracking and Data Relay Satellite in July, a DOD Defense Support Program (DSP) satellite in August, NASA's Upper Atmospheric Research Satellite in November, and the first International Microgravity

Please see **MANIFEST**, Page 4



***Columbia* lifts off on STS-35, the last mission of 1990.**

Baker bringing Soviet minister for JSC visit

Secretary of State James Baker will bring Soviet Foreign Minister Eduard Shevardnadze to JSC Monday, and they may get a chance to talk to the STS-35 crew from Mission Control.

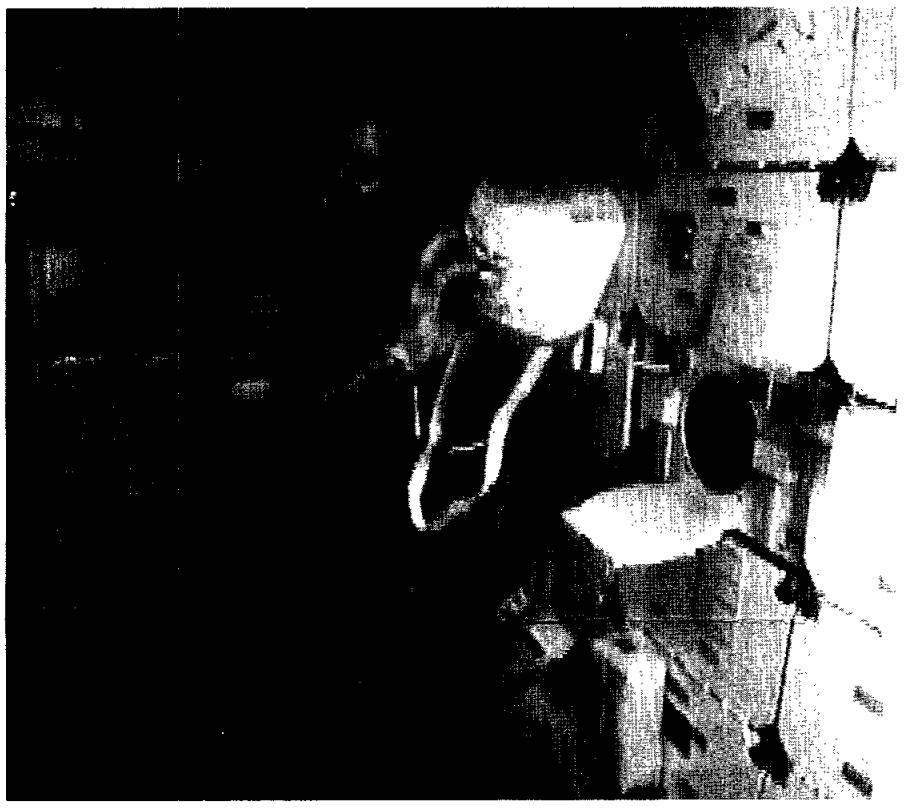
Baker will be showing off one of his favorite hometown attractions during a break in discussions with Shevardnadze.

The two diplomats will visit Houston to discuss a full range of U.S. and Soviet bi-lateral issues, including arms control.

The two will arrive at JSC about 1 p.m., visit JSC Director Aaron Cohen, go to the space shuttle and space station mock-ups in Bldg. 9A and B and continue on to the second floor Flight Control Room in Bldg. 30.

If mission activities allow, Baker and Shevardnadze may have a brief conversation with the crew aboard *Columbia* during the FCR visit.

A large contingent of news media representatives is expected to accompany Baker and Shevardnadze.



NASA Photo

STS-35 Pilot Guy Gardner shows how trash can be compacted aboard the Space Shuttle *Columbia*. The STS-35 crew is testing a new JSC-developed trash compactor that will help make extended duration missions possible in the future. A hand-driven piston compresses the trash to one-fourth its original size inside deodorized bags.

Balky display units hinder observations

By Kelly Humphries

STS-35 flight and payload controllers Thursday began collaborating on a backup method for the crew to point the Astro-1 telescopes with help from the ground after both of *Columbia*'s on-board display units shut down.

Attempts to repair the pair of Spacelab dedicated display units, shut down because of overheating problems, were continuing and scientists at Marshall Space Flight Center remained optimistic that a good portion of the observations planned during the 10-day mission could be completed.

Difficulties with the dedicated display system temporarily stopped the astronomical observations about 6:15 a.m. CST Thursday when the second DDU automatically shut itself down. Crew members immediately reported they smelled a burning scent similar to the scent they had smelled on the first flight day after manually shutting down the first DDU.

The DDUs provide the primary data path for the payload to the flight crew.

Astronauts removed an access panel and vacuumed dust and lint that apparently was clogging the ventilation intakes on the DDUs. None of the wire bundles inside the DDU's showed any signs of burning. Flight controllers were discussing procedures for attempting to power up one or both of the DDUs.

Scientists at Marshall Space Flight Center reported that all telescopes were working well and they had received excellent science data from before the second DDU shut down.

Columbia lifted off from Kennedy Space Center at 12:49 a.m. CST Sunday. The sixth shuttle night launch went smoothly and *Columbia* was placed in a 193 by 185 nautical mile orbit.

The crew—Commander Vance Brand, Pilot Guy Gardner, Mission Specialists Jeff Hoffman, Mike Lounge and Ron Parise and Payload Specialists Sam Durrance and Bob Parker—were doing well on their alternating 12-hour shifts.

Hoffman reported sighting the Soviet Mir space station through binoculars on Wednesday when *Columbia* came within 30 miles of its orbit. No voice contact was attempted, but there may be an opportunity to contact Mir with the Shuttle Amateur Radio Experiment on the last day of the flight.

Columbia is scheduled to make the fourth night shuttle landing at Edwards Air Force Base in California at 10:46 p.m. CST Tuesday.

Benefits factor in November retirements

By Kelly Humphries

The retiree distribution list for this week's Roundup will be somewhat larger as 65 employees, many of them taking advantage of their last chance for a lump sum pension withdrawal, left the center Nov. 30.

Among those retiring are JSC Human Resources Director Jack Lister, Space Station Manager for System Integration Jesse Goree and Center Operations division chiefs J.D. Williams and E.D. Carter.

The deadline for retiring and still being able to take the lump sum retirement benefit was Nov. 30. All but four of the JSC employees retiring in November did so on that date.

But Harvey Hartman, JSC's new director of Human Resources, said that's not an unusually high number of retirements for the November-January period. Since 1987, the number of retirees during that period has averaged 45, and in 1988, there were 69.

"I think what's happened here is anyone who has plans to go in any of those three or four months is going prior to Nov. 30 because of the way they've changed the benefits," said Lister, 57, who spent 29 years at JSC, 23 of them as personnel director.

"I'm not sure it's that much out of the ordinary," Lister said. "Determining people's reasons for retiring is very difficult. Even in my case, the lump sum is not the primary reason. The primary reason for retiring ought to be when you're ready from a standpoint of personal philosphy, psychology."

Lister said one factor that influenced his decision was a desire to let those working under him move up and take the reins.

Please see **LUMP**, Page 4

SPACEHAB to make space in shuttle

Commerical middeck module to add pressurized working area

By Billie Deason

JSC awarded a contract Monday to SPACEHAB Inc., Washington, D.C., to provide the services of a commercial middeck augmentation module.

The first SPACEHAB module is slated for flight aboard the space shuttle in December 1992. The leased module will ride in the payload bay when carried, be accessible through the airlock and add the volume equivalent of aboout 50 middeck lockers to the orbiter's capacity.

Under the contract, SPACEHAB will provide for the physical and operational integration of the module and the experiments, power, cooling, data management and crew training spread over six flights which will occur at intervals of about six months.

In support of private sector research initiatives, NASA is leasing two-thirds of the available module volume, over a six-flight profile. This volume will be used for flight research opportunities for NASA's Centers for the Commercial Development of Space and for Joint Endeavor Agreements. SPACEHAB will market to commercial users the remaining one-third of the module space.

The SPACEHAB lease will be managed by the CMAM Project Office in JSC's New Initiatives Office on behalf of the NASA Headquarters Office of Commercial Programs. SPACEHAB submitted the only proposal received in response to NASA's request for proposals.

The firm-fixed-price contract runs from November 1990 through December 1995. The total amount of the negotiated contract is $184,236,000. At the time of contract award, NASA will fund $7,959,000.

SPACEHAB Illustration by Alan Chinchar

The commercial middeck augmentation module will add the volume equivalent of about 50 middeck lockers to the orbiter's capacity.

JSC

Ticket Window

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

General Cinema (valid for one year): $3.75 each.

AMC Theater (valid until May 1991: prices increase Jan. to $3.75 each): $3.50 each.

Chilren's Christmas Party (10 a.m. Dec. 15, Gilruth Center): adults $1, children $4.

FBA Memberships: and coupon books are now available - $1 off Civil Service employees' first book.

Astroworld's Holiday in the Park: Pick up coupon for a special admission price of $5.50 through Dec. 31.

JSC

Gilruth Center News

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. 12 and Jan. 26. Cost is $15.

Weight safety—Required for the use of the Gilruth weight room, this class will be available from 8-9:30 p.m. Dec. 20; cost is $4.

Aerobics and exercise—Both classes are on-going.

Country and western—Next dance class begins Jan. 7 for beginners and intermediate. The six-week class meets Mondays. Cost is $20 per couple.

Ballroom dancing—Eight week courses for beginners, beginner-intermediate, intermediate and advanced students will begin Jan. 3. Cost is $60 per couple.

Health Related Fitness Program—Includes screening by medical examination and a 12 week education component. For more information call the Physical Fitness Office at x30301.

Volleyball sign-ups—Registration will be Dec. 11. This season will consist of Monday, Tuesday and Friday night games.

Basketball sign-up—Registration will be Dec. 12. This season, there will be Wednesday Mens B, Thursday Mens C and Saturday Mixed leagues.

Soccer sign-up—Registration will be Dec. 13. This season will consist of Saturday mixed leagues; non-badged teams may register Dec. 14.

JSC

Technical Library News

These new publications are available in the JSC Technical Library, Bldg. 45, Rm. 100.

The Closing of the American Mind, Allan David Bloom, 1987. E169.1 .B65.

Astronauts' Guide to Oceanographic Phenomena, R.E. Stevenson, 1988. GC10.4.A8 S73 1988.

Working Smart: A Handbook for New Managers, John Williams Zehring, 1985. HD38.2 .Z44.

File Structyure with Ada, Nancy E. Miller, 1989. QA76.73.A35 M55 1989.

JSC

Dates & Data

Today

Cafeteria menu—Special: meat sauce and spaghetti. Entrees: baked scrod, liver and onions, fried shrimp. Soup: seafood gumbo. Vegetables: green beans, buttered broccoli, whipped potatoes

Monday

Cafeteria menu—Special: wieners with baked beans. Entrees: beef chop suey, breaded cutlet with cream gravy, grilled ham steak. Soup: beef and barley. Vegetables: buttered rice, Brussels sprouts, whipped potatoes.

Tuesday

Cafeteria menu—Special: pepper steak. Entrees: fried shrimp, pork chop with applesauce, turkey a la king. Soup: celery. Vegetables: au gratin potatoes, breaded squash, buttered spinach.

Wednesday

Women's Holiday Party—A JSC Women's Holiday Party will be held at 5 p.m. on Dec. 12 in the Gilruth Center. The party will include dinner and entertainment. For more information contact your directorate secretary.

Astronomy seminar—The JSC Astronomy Seminar will hold an open discussion meeting at noon Dec. 12 in Bldg. 31, Rm. 129. For more information, call Al Jackson, 333-7679.

Cafeteria menu—Special: Mexican dinner. Entrees: fried catfish with hush puppies, braised beef ribs. Soup: seafood gumbo. Vegetables: Spanish rice, ranch beans, buttered peas.

Thursday

AIAA meets—The American Institute of Aeronautics and Astronautics will meet at 5:30 p.m. Dec. 13 at the Gilruth Center. John Young, special assistant to JSC Director Aaron Cohen for engineering, operations and safety, will speak. Tickets are $9 for members, $12 for nonmembers and $8 for students/young members. Reservations deadline is noon Dec. 10. For more information call 333-6064, 283-6000, 283-4214 or 282-3160.

NPMA social—The National Property Management Association will hold its Christmas social at 5 p.m. Dec. 13 at the Nassau Bay Hilton. For more information, call Sandra Pierce, 282-4151.

Cafeteria menu—Special: hamburger steak with onion gravy. Entrees: corned beef with cabbage and new potatoes, chicken and dumplings, tamales with chili. Soup: split pea. Vegetables: navy beans, buttered cabbage, green beans.

Dec. 14

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

Dec. 18

Book signing—Apollo 11 Astronaut Michael Collins will sign copies of his new book, "Mission to Mars" from 4-6 p.m. Dec. 18 at Jeremy's Bookshelf.

Dec. 19

Christmas concert—The Lockheed Music Makers Choir will present a Christmas concert at 11:30 a.m. Dec. 19 in Teague Auditorium. For more information, call Ray Suffron, x31773.

Dec. 20

NCMA meets—The National Contract Management Association's Space City-Houston Chapter will meet at 11:30 a.m. Dec. 20 in the Gilruth Center. Reservations are due Dec. 14; cost is $5 for members, $7.50 for nonmembers. Call Lucy Yates, x31864, or Theresa Borrego, 282-6679, for more information.

Jan. 22

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.

Feb. 2

AAS conference—The American Astronautical Society will host the Rocky Mountain annual Guidance and Control Conference Feb. 2-6 at the Keystone Lodge in Keystone Village, Colo. For information, call Alice Little at (303) 939-5147.

March 5

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

Apr. 23-26

Space Congress—The 28th annual Space Congress will be April 23-26 in Cocoa Beach, Fla. The Canaveral Council of Technical Societies will host the conference with a theme of "Space Achievement A Global Destiny." For more information contact Stuart Shadbolt at (407) 383-2200, x2202, or John Glass Jr. at (407) 383-2200, x2207.

JSC

Swap Shop

Property

Rent: Room w/phone, furn. 3 BR house in Heritage Park, $200/mo. plus 1/3 util., avail in Jan. Jay, x35814 or 992-3149.

Sale: Merritt Isle, FLA, near KSC, 5-3-2- on 2.5 acres, zoned for horses, $139K. 538-2299.

Rent/Lease: 3-1.5 house, 1,500 sq. ft., $550/mo. Steve, x32682 or 286-0638.

Rent/Lease: Monroe, duplex, 1K sq. ft., 2-1, W/D conn., $350/mo. 335-2991 or 481-4858.

Rent: Galv. condo, 2-1, FPL, all appli., new carpet, walk to beach, $550//mo. 488-2664.

Rent: Lake Travis cabin, priv. boat dock, CA/H, equipped, accomm. 8, dly/wkly, $80/$325. 326-5652.

Sale: Kerrville, TX, 12x60 mobile home, furn., good cond., lg. CP/cov. patio, $7K. 333-6150 or 326-1254.

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

Lease: Seafarer townhouse, 2-2.5-1, study, LR, breakfast, kitch., fans, FPL, backs up to golf course, furn. $975/mo. 339-3562 or 480-9470 or 333-6277.

Lease: Brentwood Subdiv., 3-2-2, $550/mo., avail. Feb. 1. 438-0201.

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

Rent: Baywind I condo, 2-2-2, W/D conn., FPL, $450. x32280 or 488-4527.

Rent: Baywind I, 1 BR condo, new carpet/paint, ex. cond., $395/mo. x36353 or 480-9280.

Sale/Lease: Lakeside condo, 2-1, 25' boat slip, $600/mo. or $44K., fin. avail. w/20% down. Carol, 244-9647 or 667-7023.

Sale: Friendswood, Fox Meadows, one acre, 60% wooded, $41K, util. avail. Laurie, x33748 or Dave, 283-5374 or 338-2368.

Sale: Univ. Green, 2-1-2, patio home, fen., new paint, vaulted ceiling, blinds, drapes, fans, FPL, deck, $76K. 480-7338.

Sale: 3-2.5-2 townhouse, fen. patio, W/D conn., 1,400 sq. ft., $22K cash. 333-7345 or 474-2339.

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

Sale: Meadowbend, 3-2-2, garden bath w/whirlpool, formals, den, study, assumable. x30382 or 334-1103.

Sale: Pipers Meadow, 3-2.5-2, formal LR/DR, FPL, loft, wet bar, fans, gar. door opener, new paint, 10% assum., $92K. Dennis, x34405 or 480-5076.

Sale: Univ. Green townhouse, 3-2-2, fans, FPL, whirlpool, loft, deck, near JSC, $90K. Dennis, x34405 or 480-5076.

Sale: Waterview condo, 3-2-2 w/boat slip, lease $700/mo. plus elec. or $69,500. 326-2221.

Lease: Sagemont, 1.5 story, 4-2-2, 2,200 sq. ft., gas heat, FPL, new paint/carpet, fans, $675/mo. plus dep., no pets, 484-4944.

Rent/Lease: 3 level CL condo on marina, all appli., FPL, wet bar, 2-2.5-2, $950/mo. 326-5652.

Sale: Timeshare, Galv. resort, $12K, OBO. (409) 938-3171.

Lease: Heritage Park, 3-2-2, FPL, formal DR, no pets, $850/mo. 282-2787 or 532-1240.

Rent: Baywind I condo, 1 BR, new carpet/paint, $395/mo. x36353 or 480-9280.

Cars & Trucks

'81 Buick Regal, 2-dr., needs mech. work, $500, OBO. 781-0818 or 996-9646 or 282-4271.

'80 VW Rabbit, ex. cond., AC, $1,550. 282-5332 or 486-5527.

'79 GMC van, custom for camping, 350 V8, AC, $1,500. 280-0176.

'82 Pontiac Phoenix, std., 4 cyl., needs body/exhaust work, $400, OBO. Ian, 333-7794 or 286-2012.

'87 Subaru XT Sports Coupe, 5-spd., 2 new tires, 59K mi., $6,450. Jeff, x34361 or 480-3410.

'89 Ford F350 PU, diesel, supercab, dually, customized, ex. cond. (409) 925-5881.

'88 Ford T-Bird TC, std., 27K mi., $10,500. Rich, 480-2570.

'85 Chevy Silverado 4x4, new tires, trans., fuel coolers, 3/4 ton, $7,100. 283-5566 or 334-4124.

'85 Pontiac Bonneville, 70K mi., loaded, V8, $3,900. 757-3827 or 488-8036.

'84 Olds Cutlass Supreme, 2-dr., high mi., but ex. cond., $2,350. Stan Goldstein, x34724.

'89 Toyota Camry sedan deluxe, auto., low mi., $12,500. Sally, x31092 or Jon, 482-5284.

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

'83 Plymouth Turismo, 2-dr. htchbk., ex. cond., 62K mi., 5-spd., $2,600, OBO. Dennis, x34405 or 480-5076.

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

'89 Firebird, 13K mi., 12 mo. tune-up warr., $9,700. Carrie, x38506 or 333-4089.

'87 Grand Am, auto., 4-dr., low mi., $5,975. x36252 or 358-9598.

'88 Olds Cutlass Cierra, ex. cond., warr., 18K mi., $7,400. x37449 or 480-1458.

'79 Buick Riviera, Turbo S-type, loaded, great cond., $1,795. 326-1181.

'87 Nova (Toyota eng.), 4-dr., auto., loaded, $3K. 940-5005.

'79 Datsun king cab truck, 4-spd., good cond., 97K mi., AC, new clutch/tires, $1,400. 481-3995.

'84 Buick Century LTD, 4-dr., V6, new tires/brakes, ex. cond., 60K mi., needs some AC work, $2,600. Bob, x33149 or 488-7036.

'81 Pontiac Grand Prix, new AC/brakes/water/fuel pump, reb. carb., new front seat/head lining, ex. cond., $1,700. Romeo, x31190.

'88 Mazda MX-6 turbo, loaded w/sunroof, low mi. x39166 or 326-5865.

'81 Monte Carlo, V8, auto., loaded, 78K mi., ex. cond., $2,500, OBO. x39216 or 482-5197.

'89 Chev. Beretta, 25K mi., 2.0L auto., $7,600. 326-2340.

'79 Pontiac LeMans station wagon, auto., AC, 84K mi., good cond., $999. Vincent, x36428 or 538-3106.

'72 Mustang-Mach 1 fast back, 351 Cleveland, Holley 4-barrel, alum. rims, radial mags, custom blower, posi-trak susp., rear air shocks, $2K. 471-3025.

Cycles

'83 Honda CR 250, ex. cond., extra parts and gear, $1K. David, 961-3775.

Honda 400cc, 15K mi., ex. cond., $450. 337-3122.

'81 Suzuki 400 GN, 9,200 mi., new rear tire, helmets, $500. Dave, 480-1225 or 538-1626.

2 childrens Schwinn Varsity 10-spd. bikes, good cond., new tires/tubes, $60/ea. or $100/both. x38947.

'80 Yamaha 175cc Enduro, good cond., low mi., $550, OBO. 482-4077.

'81 Suzuki GS450 Cafe motorcycle w/spare tire, $500. Jim, 585-0679.

Boats & Planes

Aircraft propeller, Sensenich 74DM6-0-58, fits some Beech, Piper PA-18, PA-22, PA-28, $900. 538-2299.

15' Tidecraft boat w/trlr., 50hp Mercury and super Motorguide trolling motor, rigged w/dry stor., carpet, etc., front seat steering, $1,200, OBO. 488-4453.

'81 245 Searay OMC I-O w/350 Chevy, cuddy cabin, head, 20hp Merc kicker, $9K, OBO. Scott, x36244.

'86 Bayliner Cobra OB ski boat, 125hp Force motor, runs great, $5,500. 280-4275 or 487-7930.

'89 19' Bayliner Bowrider, 125 motor, trlr., $500 down, obtain new loan. x31294 or 280-8855.

Audiovisual & Computers

IBM/PC - AT 286, 640K RAM mem., 1.2 meg & 1.44 meg floppy, 30 meg HD, EGA color monitor, 287 math co-processor, Panasonic printer, Logitech mouse, $1,700; Apple IIe w/monitor, Numeric Keypad, joy stick, $90. Jay, x35814 or 992-3149.

Daisy Wheel printer, 30 CPS, Parallel Interface, ex. cond., $145. x38805 or 488-4453.

Intel 387SX math coprocessor for 80386-SX DC, new, $200. Don Pusch, 326-3278.

Casio FC-1000 Graphic Fin. Calculator, $50; Casio fx-5000F Scientific formula 128 calculator, $20. 482-7872.

Hewlett Packard 71 B pocket computer, man., Math Pac, Fourth Assembly, $250. x34771.

Dot Matrix B&W, IBM and C-64 compat., ext. ribbons, manual, $100. Carl, x37095 or 332-1487.

IBM PS/2 50Z, VGA monitor, 2MB RAM, 60MB HD, tape backup, enhanced kybd., SW, $3,500, OBO. David, 486-9751.

Toshiba T1000se notebook computer, 3MB RAM, 2400 baud, 2 batt., case, SW, $1,250, OBO. David, 486-9751.

Computer batt. backup, El Gar, Model SPF 880, rating 550 VA, $300. Mari, x39309.

Macintosh 512 enhanced, 800K drive, $550. 280-8796.

VHS VCR (Shintom) w/remote, $75 nego., needs work. Kathy, 332-0823.

Compaq computer, 20 meg HD, 14" EGA monitor, $700, OBO. 283-4806 or 486-5380.

Musical Instruments

Roland JC 77 amp, built in chorus reverb. and distortion, stereo line out, $400 nego.; custom built Stratocaster copy w/case, Seymar Duncan pisckups, grover tuners, $300. Jerry, x34611 or Shelia, 488-5969 or 338-1393.

Comet, good cond., $80. Terry, 282-6796 or 474-5639.

Yamaha Electone ME-10 kybd., $800. Bob, x38691.

Yamaha FG-420-12 12-string guitar w/built-in pickup, ex. cond. w/case, $300; Electra Model X710 elec. guitar, $250. Mike, x32750 or 337-3182.

10 yr. old piano, good cond, $900, OBO. x37471.

Lost & Found

Lost: Nov. 3 at Gilruth soccer or football field, gold link necklace w/good luck horn pendant, reward. Robert, 283-4017.

Lost: Silver cat pinky ring, Bldg. 16 on 11-14-90. 476-5035.

Lost: Round Ray Ban sunglasses, left in FCR 2, Bldg. 30. Cathy, x30415.

Pets & Livestock

Free kittens, mother cat. 221-6566 or 640-2558.

Rabbits, mini-lop, show & pet quality. Gailo, 554-6200.

Free black male kittens. 484-7583.

AKC tri-color Collie, male, 3 yrs. old, $200. 484-7583.

Exotic Australian Shepherd dogs, $250/ea., finches, ring neck doves, guinea pigs, $5/ea. 482-6744.

Exotic min. Vietnamese pot bellied pigs w/reg. papers, white makings, $300-$2K/ea. 482-6744 or (409) 778-6976.

Litins cockatiel, male, 6 mos., cage, $80. Bob, 488-6817.

Free 5 yr. old Lhaso Apso, white/brown, good natured, papers, fem., shots. W. Smith, x38207 or 470-2013.

AKC min. Schnauzer pups, salt/pepper, championship sired, 5 males, tails/dew claws, born 11-14-90, $325. Kent, x35495 or 482-3734.

Photographic

Pentax K1000 cam. w/wide angle/zoom lenses, 2 doublers, 3 filters, bag, ex. cond., $175. Chris, 482-0317.

Household

Sofa, loveseat, chair, ex. cond., $600; coffee table, $100; free boxes. Joey, x39233 or 338-1443.

25" manual color TV in Maple cab., $50. 996-9646 or 282-4271.

Full sz. bed w/matt., frame, lt. walnut hdbd., $100. R. Franco, 992-2711.

Bunk beds, matt., springs., $150; dresser, 6 drwrs., $75; antique rocker, $25; misc. chairs. 482-7642.

Maytag washer, $75; Hot Point dryer, $150, OBO. 333-6193 or 333-6792.

Twin bed, good cond., $40. 337-4168.

Full sz. bkcs. bed, matt., $20/ea.; BSR turntable, $15. 480-3424.

Antique green bed room, full sz., mirr. dresser, chest, 2 night stands, $750; den set, queen sz. hide-a-bed, love seat, square coffee table, 2 end tables. Magdi Yassa, x33479 or 486-0788.

Lg. Stratolounger sectional, 2 pc., lt. slate blue, has queen sz. innerspring matt., 1 recliner, good cond., $500, OBO. x30923 or 996-5813.

Samsung microwave, ex. cond., 500W, $60. Tracy, x37127 or 286-3446.

Hot Point HD elec. dryer, ex. cond., $130. Monica, x37344 or (409) 938-7570.

King sz. Soft Sides wtrbd., dual bladder matt., dual htrs., $300. x36701 or 540-2451.

Rust corduroy rec. chair, ex. cond., $40; 2 bookcases, approx. 2'x6', $10/ea.; 2 brn. plush bean bag chairs, $5/ea. Bernie, x32515.

Queen sz. wtrbd. w/semi-motionless matt., htr., side pads, bench, 6 drwrs., $450. C. Bass, x35049.

8-pc. DR set, circa 1900, blk. walnut, ex. cond., $900. 482-5120.

Full sz. elec. dryer, works well, $40. Tom, x36309 or 532-2031.

19.5 cu. ft. Whirlpool refrig./freezer, white, 10 yrs. old w/ice maker, $200. 474-7432.

2 leather/glass coffee tables, $50/ea.; Amana Touchmatic II, needs repair, BO; kitchen table, butcher block, good cond., $125. 482-6744.

King sz. wtrbd. w/6 drwr. unit under bed, full floatation matt. w/htr., $125; B&W TV, 13", $25. Rosemary Long, x30035 or 554-4710.

23 cu. ft. chest freezer, works, has slow freon leak, $75; 2 cu. ft. Kenmore refrig., good cond, $50. Rick, 283-1988 or 996-8961.

Loveseat, $50; rocker, $25; dining chair, $15; spkr. cab. tables, $25; dinette table, $50; computer hutch, $25; ceiling fan, $10; chandelier, $25. Floyd, x37459.

Sears 25" color TV, $150; queen sz. bed/frame, $50; 6 drwr. blk. dresser, $50; childs oak BR set, $100; 5 drwr. desk, $30; butcher block table, $20; 6 wood stack chairs, $5/ea.; wood/glass bookcase/liquor cab., $25; ster. rec., $20; art. Xmas tree, $25; 2 glass end tables, $10/ea.; wood/glass coffee table, $10; chrome arc lamp, $10; Lady Spaulding golf clubs, $75. Barbara Clark, 488-4102 or (409) 925-7405.

Wanted

Want '82 Datsun 200 SX hard top coupe, auto. Fred, 944-0493.

Want used Nintendo games. 337-3122.

Want old wrist and pocket watches, any condition. 480-7338.

Want housemate, m/f non smoker to share 3-2-2 house w/rehearsal space, near JSC, $300 plus. John, x39147.

Want riders for vanpool starting from SW side and Braeswood - 610 locations to JSC. Chau, x31451.

Want van pool riders from Sugarland, West Wood Mall, Fondren and Loop 610 Park & Ride to JSC. Alice, x35234.

Want Kitchenaide or equivalent HD mixer w/bowls and access., good cond. 486-8463.

Want Lionel trains, any condition. 482-6744.

Want toy trains and Starwars toys. Ron, 482-1385.

Want older PU, van, S/W w/good motor & auto. trans., less than $1K. Tony, x35966.

Want Scuba gear for man, suit, BC, reg., etc. 280-8796.

Miscellaneous

Shopsmith, Mark V w/jointer, $1K nego; mens 14K .25 diamond ring, $300, nego; new compressor, 3hp, 22gal., $250. Jerry, x34611 or Shelia, 488-5969 or 338-1393.

BMW 3-series cast alum. rims, $80/ea., OBO; Audi 5000S '81 rim, $25. Scott, x36244.

'81 Datsun 280 ZX dash, new, $220; '81 Datsun 280 ZX dash cov., $50. Joey, x39233 or 338-1443.

2 skate boards, lg. and sm., $15/ea. Aaron Brown, 944-0493.

Ladies ski boots, used 1 season, sz. 8 1/2, $50; new Serta suntamp on 5' stand, $35; ladies foxtail jacket, new, $300. x34236 or 486-0174.

Box of computer printer paper (20lt), 9 1/2x11, $10. x36814.

Little Tykes treehouse, $25; Fischer Price car seat, $25. 486-4145.

Womans sz. 10 raccoon parka, $375; mahogany mink cape, sz. 10, ex. cond., $375. 333-3885.

1 handicap & 1 std. commode, work fine, BO; chain link fence, 45', 5' high w/gate, BO. Ray, x53954 or 487-4889.

Baseball cards, N. Ryan, Bo Jackson, K. Griffey, Jr. 7 rookies. 482-7005.

Int./Ext. Sherwin Williams paint, browns/grays, $4/gal.; 1x8's, 7-20' long, $1/ea.; Lap & Gap style, approx. 200 boards, some 2x4's, 25¢/ea., 4-8'. 339-1337.

18" gold herringbone chain, $200; 12K/6 diamond cluster gold nugget ring, $350; 10 pt. diamond gold nugget pinky ring, $175. 996-9943.

Moving boxes, approx. 50 boxes, var. szs., all for $40. 334-4124 or 244-5035.

Carpet pad, 5 lb., 5/8", 30 sq. yds., ex. cond., $1/yd., OBO. 486-8266.

Assorted maternity clothes, baby items, baby & infant to sz. 3 clothing (girls). 332-0442.

Hotel Express membership, save 50% on hotels, valid thru Nov. '91, $39. 488-2946.

Sz. 11-12 peach lace over peach satin, tea length, formal gown, low cut V back, satin sash, $100, OBO. 334-3664.

'75 Honda 550cc, $450; old 6hp Mercury OB; Scuba BC sm. & med., $75/ea.; spare air, $125; spear gun, $70 & $110. x30686 or 480-3260.

1 pr. ladies ski boots, sz. 7, new, $50. Mike, x33380 or 538-1121.

Furn. dolly, shop fans, 10" table saw, pwr. mitor box, radial arm saw, 75K BTU gas htr., wtr. pump, cords, chains, hoses, shotgun w/loader, shells, access. 474-5558.

Pres. & 1st Lady Charter Gold, $700, OBO; yearly renewal fee, $75; 14' diam. trampoline, $125. Rob, x33127 or Georgia, x37867 or 332-3077.

Xerox 3701 copier, needs $450 repair, $300, OBO. Don, x38039 or 333-1751.

Sears Craftsman riding lawnmower, 6hp, 25" cut, good cond., $250. x35180 or 326-3706.

Honda 72cc motorcycle eng., $25, OBO. Floyd, x37459.

Artison auto. pool vac, $250, 6 mos. old. Terry, x33814 or 486-5126.

2-dr. leg. sz. file cab., ex. cond., $100. x30874 or 333-1316.

Engagement ring, 18K yellow gold, round diamond solitaire (.68 carats) w/6 round diamonds (.18 carats), $1,200. x30874 or 333-1316.

Fiberglass camper shell for shortbed import PU, w/carpeted int., $175. Dave, 480-1225 or 538-1626.

Elec. sewing mach., cust. floor model, drop unit, chair, $250. 326-2221.

3/4 carat diamond ring, wide band, solitaire surr. by heart of diamonds. x32181 or 280-8774.

Windsurfing speed sail; 6'2" Hurricane surfboard, ex. cond.; 6'8" Channel Island surfboard, ex. cond. Keith, 333-5488 or Chuck, x36343.

Metal typing table, drop leaf, $20; 2 sm. blackboards, $10/both; AM/FM radio w/phone, $12.50; sm. desk light, $8; flourescent desl light, $12.50; sm. round table w/4 Bentwood antique chairs, $125; childs antique rocker and chair, $25/ea.; doll furn., $6-$20; antique drop leaf DR table, $350. 488-5564.

Brio wooden toys, 3 trains, 3 bridges, trestle, tunnel, overpass, boat w/dock, track, $100; girls 26" 3-spd. bike, $15; 2 basketball hoops, $5/ea. 488-2283.

Cable conv. by Scientific Atlanta, all chan. rem. control of your non-remote TV, $50. 333-3071.

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

Sears exer. rowing/XG skier mach., ex. cond., $125. (409) 938-3171.

Sears lifestyler cross country skier/rower, ex. cond., $175. Brent, x36456 or 486-0389.

Mitsibushi ster. sys., AM/FM rec., equalizer, dual cass. deck, amp, turntable. x37449 or 480-1458.

4 GMC slotted alum. mags w/P235/75R15MTS Uniroyal Tiger Paw blackwall tires w/lug nuts, $450. Gwen, x34353 or Albert, (409) 938-1328.

Baby crib, matt., $55; white wicker changing table, $45; deluxe carriage/stroller, $50; playpen, portacrib, swing, walker, ex. cond. Joan, 480-9250 or 474-7634.

Designer jewelry samples, wide assort. Dean, x34132 or 486-5331.

Leather jacket, lined, sz. 42, $50. Jerry, x38835 or 482-8494.

Porcelain dolls, Cinderella, Gibson Girl, modern bride, ex. cond. Barbara, 488-6521.

14K, 2 carat diamond tennis bracelet, $900. Barbara, 781-5477 or Jan, 282-2663.

Tunturi "202" rowing mach., ex. cond., $50. Gary, x31361 or 554-4109.

Jobst extremity pump, $100, ex. cond. Earl, x34807 or 532-2242.

One-way nonstop Continental Airlines ticket, leave Ft. Myers, FLA 5:30 p.m. Fri., Dec. 28, arrive Houston Intercontinental 7:35 p.m., $85, OBO; 2 drafting stools, adj., polished chrome w/foot ring, upholstered seat/back, BO. Bob, 480-1225 or 474-4747.

5hp single cylinder antique Make & Break marine eng. w/bronze shaft/screw, wtr. cooled, good cond., $450; '35 model B John Deere on rubber w/PTO and hydraulics, manuals, good cond., $1,600. Phil, x30220.

Speed Queen gas dryer, lg. cap., needs sensor switch, $40; KOA camping coupons, good at any KOA campground. David, 282-4519 or 486-5732.

Moving boxes, all szs., 1/2 commercial rate. x33182 or 486-2622.

Lapidary, 6" rock trim saw w/motor, dual mandrel w/motor, 1-6" wheel, 1-8" wheel, 1-3" wide by 8" diam. buffing wheel, $125; rock and min. collection, over 300 samples in display case, $50. Phil, x30220.

Antique Mahogany BR set, matt., springs, hd. and ftbd., dresser, vanity/desk, bench, $150, OBO; wgt. set, $40, OBO; king/queen sz. wtrbd. padded rails, new, $15, OBO. Leah, x34544 or 480-8780.

Rebuilt Ford 390 long block eng., $300; Holley carb. (recpts.) Ford PU C-6 auto. trans., $150; '73 Olds trans., $75; G.E. 22 cu. ft side-by-side refrig., $150; eng. buildup stand, new, $60; Craftsman skill saw, $45. 554-2769

SPACE SHUTTLE MANIFEST

	39	37	40	43	44	48	42
Mission	March	April	May	July	August	November	December
Date	***Discovery***	***Atlantis***	***Columbia***	***Discovery***	***Atlantis***	***Discovery***	***Atlantis***
Orbiter	AFP-675	GRO	SLS-01	TDRS-E	DSP, IOCM,	UARS	IML-01
Payload	IBSS	CETA	GAS BRIDGE	SSBUV-03, SHARE II,	DOD M88-01,		IMAX-5
	STP-01	AMOS-08		OCTW-01, TPC	CREAM-A, AMOS-10		GAS BRIDGE
	MPEC	APM-02		AMOS-09			
Inclination	57°	28.5°	39°	28.5°	28.5°	57°	28.5°
Altitude	140	243	150	160	195	292	165
Duration	8	5	9	9	10	5	7
Crew CDR	Michael L. Coats	Steven R. Nagel	Bryan D. O'Connor	John E. Blaha	Frederick D. Gregory		Ronald J. Grabe
PLT	L. Blaine Hammond, Jr.	Kenneth D. Cameron	Sidney M. Gutierrez	Michael A. Baker	Terence T. Henricks		Stephen S. Oswald
MS	Guion S. Bluford, Jr.	Jerome Apt	James P. Bagian	James C. Adamson	F. Story Musgrave		PLC Norman E. Thagard
	Gregory J. Harbaugh	Linda M. Godwin	Tamara E. Jernigan	G. David Low	Mario Runco, Jr.		Manley L. Carter, Jr.
	Richard J. Hieb	Jerry L. Ross	Rhea Seddon	Shannon W. Lucid	James S. Voss		William F. Readdy
	Donald R. McMonagle						
	Charles Lacy Veach						
PS			F. Drew Gaffney		TBD		Roberta L. Bondar
			Millie Hughes-Fulford				Ulf D. Merbold

	46	45	49	50	51	47	52	53
Mission	March	April	May	June	August	September	October	November
Date	***Discovery***	***Atlantis***	***Endeavour***	***Columbia***	***Atlantis***	***Endeavour***	***Columbia***	***Discovery***
Orbiter	TSS-01	ATLAS-01	INTELSAT-VI-R	USML-01	ACTS	SL-J	LAGEOS II	DOD
Payload	EURECA-1L	SSBUV-04	ASEM		CANEX-02	GAS BRIDGE	EURECA-1R	
	IMAX-06				DXS		USMP-01	
	EOIM-III/TEMP2A-03						ASP	
Inclination	28.5°	57°	28.5°	28.5°	28.5°	57°	28.5°	
Altitude	230	160	198	140	160	160	160	
Duration	7	9	8	13	7	7	9	TBD
Crew CDR	TBD	Charles F. Bolden				TBD		
PLT	TBD	Brian Duffy				TBD		
MS	PLC Jeffrey A. Hoffman	PLC Kathryn D. Sullivan				PLC Mark C. Lee		
	Franklin R. Chang-Diaz	C. Michael Foale				N. Jan Davis		
	Claude Nicollier	David C. Leestma				Mae C. Jemison		
	TBD					TBD		
PS	TBD (Italy)	Michael L. Lampton				Mamoru Mohri		
		Byron K. Lichtenberg						

	54	55	56	58	57	59	60	61	62
Mission	January	February	March	May	May	June	July	September	September
Date	***Endeavour***	***Columbia***	***Discovery***	***Atlantis***	***Endeavour***	***Columbia***	***Discovery***	***Endeavour***	***Atlantis***
Orbiter	SPACEHAB-01	SL-D2	WSF-01	TDRS-F	ATLAS-02	SPACEHAB-02	HST REV-01	SRAD/TPITS	LITE
Payload	ORFEUS-SPAS		FTS-DTF-01	DEE	SPTN-02	CAPL		ISEM-01	SPAS-III
	GAS BRIDGE		IEH		SSBUV/A-01	HPE		OAET-01	FLOATZONE-01
	SHOOT		Payload of opportunity			CMSE-01			CTM
						Payload of opportunity			MICROWAVE-01
Inclination	28.5°	28.5°	28.5°	28.5°	57°	TBD	28.5°	28.5°	28.5°
Altitude	160	160	160	160	160	TBD	TBD	160	TBD
Duration	7	9	7	5	9	TBD	5	5	5
Crew	7	7	5	5	7	TBD	5	5	5

Fiscal Year '94

1st QTR	2nd QTR	3rd QTR	4th QTR
SLS-02	GEOSTAR-01	SATCOM	USML-02
USMP-02	SPACEHAB-03	WSF-02	INMARSAT
FROZENPIPE	CXM-02	CXM-03	SFU-RETR
SPTN-03	ISEM-02	CXH-09	FTS-DTF-02
CXH-08	IML-02	EURECA-2L	CXH-10
SRL-01	CRISTA-SPAS	SPACEHAB-04	USMP-03
	ATLAS-03	CXM-04	OAET-FLYER
	SSBUV/A-02	SPTN-04	

Fiscal Year '95

1st QTR	2nd QTR	3rd QTR	4th QTR
AAFE	XTE	SRL-D3	ATLAS-04
OAET-02	EUVE RETR	TDRS-G	WISP
TANK VENT	SPACEHAB-05		SSBUVA/A-03
2 PHASE FLOW	GEOSTAR-02		SPTN-05
BATTERY	EURECA-2R		WSF-03
PL OPPTY	SSF/MB-01(FEL)		SPACEHAB-06
SRL-02			OAET-03
			SSS
			SSF/MB-02

Fiscal Year '96

1st QTR	2nd QTR	3rd QTR	4th QTR
SSF/MB-03	TDRS-H	USMP-04	SPACEHAB-07
SSF/MB-04	SSF/MB-05	GEOSTAR-03	OAET-04
SLS-03		CONE	SSF/MB-07 (MTC)
		SRL-03	SSF/OF-01
		HST REV-02	ATLAS-05
		SSF/MB-06	SSBUV/A-04

Glossary

AAFE	Aeroassist Flight Experiment
ACTS	Advanced Communications Technology Satellite
AFP	Air Force Payload
AMOS	Air Force Maui Optical Station
APM	Ascent Particle Monitor
ASP	Altitude Sensor Package
ATLAS	Atmospheric Laboratory for Applications and Science
CANEX	Canadian Experiment
CAPL	Capillary Pump Loop Experiment
CETA	Crew and Equipment Translation Aid
CMSE	Candidate Materials Space Exposure
CONE	Cryogenic Orbital Nitrogen Experiment
CREAM	Cosmic Radiation Effects and Activation Monitor
CRISTA	Cryogenic Infrared Spectrometer Telescope for Atmosphere
CTM	Collapsible Tube Mast
CXH	Commercial Cross-Bay Carrier
CXM	Commercial Cross-Bay for Materials Science Laboratory
DEE	Dexterous End Effector
DOD	Department of Defense
DSP	Defense Support Program
DXS	Diffuse X-Ray Spectrometer
EOIM	Evaluation of Oxygen Interaction with Materials
EURECA	European Retrievable Carrier
EUVE	Extreme Ultraviolet Explorer
FLOATZONE	Office of Commercial Programs Experiment
FTS-DT	Flight Telerobotic Servicer Demonstration Test Flight
GAS	Getaway Special
GEOSTAR	Interactive Radiodetermination Satellite
GRO	Gamma Ray Observatory
HPE	Heat Pipe Experiment
HST	Hubble Space Telescope
IBSS	Infrared Background Signature Survey
IEH	International Extreme-UV Far-UV Hitchhiker
IMAX	Large format motion picture camera
IML	International Microgravity Laboratory
INMARST	International Maritime Satellite
INTELSAT	International Telecommunications Satellite Organization
IOCM	Interim Operational Contamination Monitor
ISEM	ITA Standardized Experiment
LAGEOS	Laser Geodynamics Satelllite
LITE	Lidar In-Space Technology Experiment
MICROWAVE	Office of Commercial Programs.Experiment
MPEC	Multi-Purpose Experiment Canister
OAET	Office of Aeronautics, Exploration and Technology
OCTW	Opitical Communication Thru Shuttle Window
ORFEUS	Orbiting and Retrievable Far and Extreme Ultraviolet Spectrometer
SATCOM	GE communications satellite
SFU	Space Flyer Unit
SHARE	Space Station Heat Pipe Advanced Radiator Experiment
SL	Spacelab
SHOOT	Super Fluid Helium On Orbit
SLS	Space Life Sciences
SPACEHAB	Commercially owned pressurized experiment module
SPAS	Shuttle Pallet Satellite
SPTN	Shuttle Pointed Autonomous Research Tool for Astronomy
SRAD	Shuttle Radiator Assembly Demonstration
SRL	Space Radar Laboratory
SSBUV	Shuttle Solar Backscatter Ultra-Violet Instrument
SSF/MB	Space Station *Freedom* Manned Base
SSS	Satellite Servicer System
STARLAB	DOD Spacelab
STP	Space Test Program
TDRS	Tracking Data Relay Satellite
TPITS	Two Phase Integrated Thermal System
TSS	Tethered Satellite System
UARS	Upper Atmosphere Research Satellite
ULYSSES	Formerly International Solar Polar Mission
USML	U.S. Microgravity Laboratory
USMP	United States Microgravity Payload
WISP	Waves in Space Plasma
WSF	Wake Shield Facility
XTE	X-Ray Timing Explorer

New treatment eases space motion sickness effects

By Kari Fluegel

Physicians at JSC have instituted a new treatment for space motion sickness that has markedly decreased the severity of the illness in crew members.

Promethazine, an intramuscular treatment administered after the onset of symptoms, has helped decrease the symptoms of space motion sickness on 14 occasions since NASA's return to flight in September 1988, according to Dr. Sam Pool, chief of JSC's Medical Sciences Division.

Medical researchers believe changes in the body's vestibular system contribute significantly to space motion sickness. The vestibular system regulates the body's sense of balance and, when the tiny stones in the inner ear called otoliths no longer have weight in a microgravity environment, the brain may misinterpret the sensations an individual may feel while moving around in microgravity. The unusual visual cues experienced during floating in the shuttle orbiter cabin may further confuse the brain's perceptions and produce symptoms.

Since the early days of space flight, many space travelers have experienced this space motion sickness. Symptoms resemble those of Earth-based motion sickness and may include headache, malaise, lethargy, stomach awareness, loss of appetite, nausea and/or episodic vomiting. Symptoms tend to worsen during body movement, especially movements of the head.

In the first 24 missions of the space shuttle program, about 67 percent of the 85 crew members making their first flight reported symptoms of space motion sickness. About 30 percent reported mild symptoms; 24 percent, moderate symptoms; and 13 percent severe symptoms. Most recovered by the end of the third day in space. In one extreme case in the Soviet Salyut 6 mission, however, one crew member was ill for 14 days. The incidence of space motion sickness among those making a second flight dropped to 46 percent.

During the first 24 shuttle missions, scopolamine and a combination of scopolamine and dextroamphetamine, given orally, were used to treat space motion sickness. Recent studies at the JSC Biomedical Operations and Research Branch by Drs. Nitza Cintron and Lakshmi Putcha, however, have shown that the oral absorption of scopolamine and other medications in weightlessness is unpredictable.

Since the initiation of intramuscular promethazine therapy, shuttle crew members have not experienced severe cases of space motion sickness and almost all have been essentially symptom free by the end of the second flight day. Crew members now receive training in administering the medication should space motion sickness develop during shuttle flights. Research for space motion sickness is sponsored by NASA's Office of Space Science and Applications.

JSC Photo

HIGHER LEARNING—Astronaut Mario Runco explains the rotational hand controller on the manned maneuvering engineering unit to Dr. Marguerite Ross Barnett, president of the University of Houston in Bldg. 9B. JSC Director Aaron Cohen hosted the recent visit by Barnett and Dr. Roger Eichorn, dean of the UH College of Engineering, left.

Galileo to make dramatic Earth flyby tomorrow

By Pam Alloway

The Galileo spacecraft will make a dramatic pass by Earth about 2:35 p.m. CST Saturday, the second of three such astronomical flybys needed to boost the spacecraft on its way to Jupiter.

Operated by NASA's Jet Propulsion Laboratory, Galileo began its 2.4 billion mile journey on Oct. 18, 1989, when it was launched from the Space Shuttle *Atlantis*. During the course of its mission, Galileo will travel about 593 miles above the Atlantic Ocean east of Florida Saturday. That flyby will enlarge the spacecraft's orbit around the Sun and propel it toward the solar system's largest planet, Jupiter.

Galileo will study Earth during Saturday's flyby and during a similar maneuver in December 1992, making it the first spacecraft to approach Earth from interplanetary space. It will take photographs, measure gases that cause climate warming and examine the hole in the Earth's protective ozone layer above Antarctica. It also will look at the far side of the Earth's Moon.

In its Saturday Earth approach, the spacecraft will travel from outside Earth's orbit, cross behind the Earth, and fly over the planet's sunward side in order to gain energy from the Earth. This energy is needed to raise Galileo's orbit, first to the Asteroid Belt and, in a second gravity assist, finally to meet Jupiter in 1995.

The spacecraft is traveling at a speed of 65,800 mph in its orbit around the Sun. Galileo's speed will increase gradually as it moves closer to Earth's orbit and the Sun. Saturday's Earth gravity assist, which will occur around 2:35 p.m. CST at the spacecraft's closest approach, will boost Galileo's orbital speed by about 11,500 mph. Galileo's closest approach altitude will be about 590 miles.

Scientists report the spacecraft is performing well. In the past two weeks Galileo: played back the Venus science data, stored on tape since last February; carried out a variety of science instrument calibrations and engineering operations; and successfully completed the last and smallest of the trim maneuvers scheduled before the Earth gravity assist.

A press conference to discuss the gravity assist and other Galileo activities near Earth is scheduled for 3:30 p.m. CST Saturday. The press conference will originate from JPL and will be broadcast on NASA Select.

NASA training to include Japanese

NASA recently affirmed its intent to invite two Japanese astronaut candidates to join the next NASA mission specialist training class, beginning in July 1992.

William Lenoir, associate administrator for space flight, reiterated the invitation to Katsuhisa Ida, research and development director-general for the Space and Technology Agency of Japan. Lenoir and Ida were among the participants in a series of discussions that culminated in the fourth NASA/Space Activities Commission Cooperative Space Activities Planning Group meeting last week.

The Japanese mission specialist candidates will participate in training on the same basis as U.S. mission specialist candidates at JSC. NASA intends to offer a space shuttle flight assignment to one or both of the Japanese mission specialist candidates in the years following the successful completion of the training program.

NASA and STA are actively reviewing options for flying Japanese Experiment Module hardware on a space shuttle mission in the mid-1990s. The JEM is Japan's contribution to the Space Station *Freedom* program. The purpose of such a shuttle flight would be to demonstrate in space a key element of the JEM.

NASA also offered Japan an opportunity to send Japanese engineers to work and train in JSC's Mission Operations Directorate during mission preparation and operations activities for the Spacelab-J mission. This will enable Japan to obtain additional flight operations experience prior to the space station era.

The Cooperative Space Activities Planning Group meets annually to review ongoing space cooperation between the U.S. and Japan. Discussions focused on a number of collaborative projects in the fields of astrophysics, solar system science, microgravity science, life science and Earth observation. The meeting was co-chaired by Dr. Lennard Fisk, NASA associate administrator for space science and applications.

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

Manifest names future flights

(Continued from Page 1)

Laboratory Spacelab mission in December.

Shuttle highlights in 1992 will include the first flight of a new space-age tool, called the Tethered Satellite System (TSS-1), a joint U.S./Italian project. The European Space Agency's European Retrievable Carrier also will be deployed.

Also making its debut in 1992 will be the orbiter *Endeavour*. On its maiden flight, STS-49, astronauts will attach a new perigee kick motor to a stranded INTELSAT communications satellite which failed to reach its proper orbit after launch.

Lump sum rule triggers retirement decisions and mixed feelings

(Continued from Page 1)

"There comes a time when you need to pass the baton," he said. "I will surely miss JSC and the outstanding people who work here."

Lois Ransdell, who started as a GS-2 secretary 26 years ago, said she retired Nov. 30 because she turned 65 on Nov. 28. Now a GS-9 procurement contract specialist, she's not taking her retirement pension in a lump sum.

"I need that assured little lump every month," she said. "I hate to leave all these good friends and the people who have helped me and given me breaks over the years. I met a lot of fascinating, terrific people and I will be eternally grateful to the government for giving me a job when I really needed it."

On the other hand, Technical Services Division Chief J.D. Williams said he had planned to work two or three years longer had it not been for the change in the lump sum rule.

"I've really got mixed emotions about whether I'm making the right decision or not," Williams said. "(The change) causes a lot of good people, a lot of talent around the center, to leave. Yet it has a good side in that it clears some way for some new blood in the organization."

His Center Operations cohort, Facility Development Division Chief E.D. Carter, said "lump sum was the factor."

Carter, 63, said he worked with Human Resources advisers in August to make projections on retirement in 1992 or 1993, but when the lump sum rules changed he was faced with a tough decision.

"I don't know of any decision in my professional career that's been any tougher to make," he said. "My heart and emotions were on one shoulder whispering in my ear, and a practical fellow was whispering in my other ear. In my instance it was more practical to take the money.

"Had I listened to my heart and my emotions I would have stayed here," he said. "I have a great group of people over here to work with. A lot of exciting things are happening here. We're going through the largest facilities expansion program the center has seen since it was built. It's a very busy, exciting time for our world and I wanted to see a little more of that."

Jesse Goree, who has worked for the federal government for 33 years—29 of them at JSC, said he had been planning to leave at the end of December anyway, but that "lump sum certainly influenced me."

Goree only recently was appointed to head up system integration for the Space Station *Freedom* program. He said he took that job to help integration manager Dick Thorson and Space Station Program Director Dick Kohrs get the activity organized.

He said he feels he's done that, even though the new space station redefinition effort resulting from lower than hoped for funding has left station plans unsettled.

"It leaves it a little bit up in the air, but I think I've done what I needed to do and the people who are going to be here will pick up and carry on," he said.

Goree said at his age, it is a toss-up as to whether the lump sum or monthly annuity are better.

Other retirees in November were:

Administration: Willie E. Wright, John L. Ford, Jerry Haptonstall, Charles Beckman, Darrell Vandiver, Freddie Pete, James M. Lindsay, Samuel Weathersby, E. Alan Troeger and Donald Hess.

Flight Crew Operations: Donald J. Bourque, Glenn O. Pingry, John W. Dale, Alan F. Blask and David F. Nicolson.

Mission Operations: Francis Abernethy, James Roundtree, Louis E. Hackney and Ben F. McCreary.

Engineering: Marcus Broussard, Thomas E. Lewis, Larry L. Sutton, Olin L. Graham, Bobby Vermillion, Annie M. Patrick, Richard W. High, Witalij Karakulko, Thomas J. Dunn, Alden C. Mackey, Billy M. Adams, Francis DeVos and Martin D. Jenness.

New Initiatives: Abelino B. Sanchez and Donald R. Smith.

Center Operations: John C. Welch, Joe H. Fulton, Tommy F. Fleming, James R. Martin, James C. Clarke, William J. Lehman, Bert W. Hanson, Charles T. Hall, Thomas W. Davis and Gaetano Marsella.

Safety, Reliability and Quality Assurance: Wilbert Williams.

Information Systems: John A. Roth.

White Sands Test Facility: David L. Pippen.

Space and Life Sciences: Rose McCullough, David J. Horrigan and Donald G. Wiseman.

Space Shuttle Integration and Operations: Shirley G. Huss, Raymond G. Zedekar and Ruby J. Summers.

Orbiter and GFE Projects Office: Humberto Alcantar, Billie Johnson, John E. Williams, Robert W. Fricke, Steven M. Andrich, Ben R. Hand and Roger D. Hicks.

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