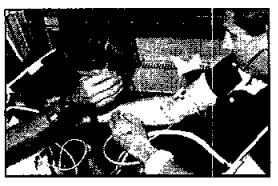
NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas



Good reviews

Scientists poring through Spacelab Life Sciences-1 research say it is exceeding expectations. Story on Page 3.

Rescue rangers

Astronauts preparing for the Intelsat rescue are using a new tool called the Errant Satellite Simulator. Photo on Page 4.

Space News Roundup

Vol. 30 | June 28, 1991 | No. 26

Congressmen applaud work on *Freedom*

Five members of the House Subcommittee on Space visited JSC on Saturday, getting a close-up look at the progress that has been made on Space Station *Freedom*.

Chairman Ralph Hall, D-Texas, said after the visit that he was convinced more than ever that Freedom needs to be built, citing potential medical advances that could help discover cures for some of Earth's most insidious diseases as just one example of the work that could be done.

All five said they would continue to try to convince their colleagues in the House of Representatives that long-term support of the station is needed, and that the nearly $5 billion that has been spent should not be wasted at this stage of the game.

"I think what we now want to do is to go back and encourage the appropriations committee to see what we've seen on this trip," said Rep. Ron Packard, R-Calif.

Hall and Packard were joined by Rep. Joe Barton, R-Texas; Rep. John Rhodes III, R-Ariz.; and Rep. Jim Bacchus, R-Fla.

The group met with JSC Director Aaron Cohen and Deputy Director Paul J. Weitz before beginning their tour in the Bldg. 9 complex. Astronauts Dan Brandenstein and Pierre Thuot briefed them on the Intelsat satellite rescue mission hardware.

Please see ***FREEDOM***, Page 4

JSC Photo by Bob Walck

Chuch Lewis, manager of the Space Station Mission Operations Project Office, briefs a congressional delegation from atop a stack of sheetrock inside the Space Station Control Center, now under construction. Listening to the briefing are Rep. Ralph Hall, D-Texas, chairman of the House Subcommittee on Space, and fellow subcommittee members Rep. Ron Packard, R-Calif.; Rep. Joe Barton, R-Texas; Rep. John Rhodes ill, R-Ariz.; and Rep. Jim Bacchus, R-Fla. The wives of several of the congressmen, and several staff members, accompanied the group. The new SSCC addition to Bldg. 30 is about 75 percent complete, and the fifth floor is expected to be ready for occupancy by September.

Crew ready as *Atlantis* joins payload at pad

Atlantis dodged lightning storms at Kennedy Space Center and joined its Tracking and Data Relay Satellite cargo at launch pad 39A this week following the quickest vehicle turnaround since return to flight.

The NASA communications satellite, with its powerful inertial upper stage that together weigh nearly 40,000 pounds, was loaded aboard the orbiter Wednesday.

Routine launch pad operations began Tuesday, shortly after *Atlantis* made the 3 1/2 mile trip from the Vehicle Assembly Bldg. to the pad atop the mobile launch platform.

The crew for OV-104's ninth flight is scheduled to take part in a practice countdown next week as workers prepare the spacecraft's aft compartment beneath them.

Commander John Blaha, Pilot Mike Baker and Mission Specialists Shannon Lucid, David Low and Jim Adamson will fly to the Shuttle Landing Facility aboard T-38 training jets for the practice count and emergency egress training.

"It's going to be a challenging mission," Blaha said Wednesday. "The first day is the TDRS deploy and the next eight days we'll spend doing medical and scientific research to try to understand better ways for people to live here on the Earth."

Crew members said they are looking forward to the mission, which has been extended from five to nine days so that it may serve as what Low called a "build-up mission" for future long-duration flights.

"I was happy that we went from five to nine days," said Blaha, an Air Force colonel who will be making his third shuttle flight. "I wish we could stay up there 50 days."

Lead Flight Director Rob Kelso said Thursday that, although there have been three previous TDRS deployments, this flight remains a challenge because of the complex coordination required among shuttle, satellite and inertial upper stage controllers and the crew.

"It takes a big team to launch something like the TDRS/IUS complex," agreed Lucid, who has prime responsibility for the TDRS deployment about seven hours after launch.

Adamson, an Army colonel and former flight controller making his second flight, will work with Lucid to ready the TDRS/IUS systems for deployment. Baker, a Navy commander making his first flight, will keep *Atlantis* in the proper attitude for deployment while Blaha and Low will monitor orbiter systems. Low, making his second shuttle flight, also will photograph the deployment.

The fourth satellite in the TDRS network, which provides nearly continuous communication between the ground, the shuttle and other satellites such as the Hubble Space Telescope and Gamma Ray Observ-

Please see ***ATLANTIS***, Page 4

Andy Petro

Engineer gets global perspective

By Kelly Humphries

By now, JSC's Andy Petro is knee-deep in his coursework at the fourth annual summer session of the International Space University in Toulouse, France.

Petro, an engineer in the Systems Definition Branch of Engineering's Systems Engineering Division, is there for 10 weeks with 130 students from about 30 countries and professors from around the world. Together, they are studying all aspects of space flight, including life sciences, law, architecture, engineering, science and the humanities.

The schedule is heavy, with classes all day and more activities in the evenings and on weekends. And, in addition to their course work, they're planning a hypothetical international mission to Mars.

"I'm excited," Petro said before he left June 15. "It's a tremendous opportunity, as well as what you're going to learn and contribute as part of the project, to meet all these different people from different countries who have their own perspectives on space programs."

Petro said he hopes to gain a better understanding of how people from other countries view their future in space, an important lesson in view of his belief that America won't be able to accomplish everything it wants to without international cooperation. The summer ISU sessions are the beginnings of what will eventually be a full-time university program in a permanent location, he said, and Houston is one of the cities vying for that site.

"It'll play a big part in future international

Please see **PETRO**, Page 4

First *Freedom* software arrives

Group invites applications developers to take test drive

By Kelly Humphries

JSC has taken delivery of an early version of the computer operating system for Space Station *Freedom*, and potential application developers are being invited to come over and try it out.

Dave Pruett, chief of Engineering's Systems Development Branch, said the new data management system software is the basis for the space station's onboard computer system.

"We have taken delivery of an internal release version of the DMS operating system that is undergoing development and integration tests right now," he said.

"We got it primarily because we plan to develop some test cases for IBM to use in their final testing of the system," Pruett added. "Specifically, the test cases will be written to stress the system to overburden it to see where it cracks, where it falls apart. We're pretty sure it will somewhere, but we want to find out what the safe operational envelope is."

The software, now on a personal computer in the Flight Data Systems Division's Real-Time Systems Engineering Laboratory, is capable of running applications written in the Ada or C computer programming languages. It will even support multiple Ada real-time programs, a unique facet of this operating system that can be demonstrated in the Bldg. 16 lab, he said. The standard DMS services Ada interface isn't available yet.

Pruett said his group is looking for test users with space station applications, particularly those in mission operations and training, because "I know they're interested, but I don't know who they are." Anyone interested in joint compatibility and performance evaluations of simulated or prototype space station systems or subsystems should call Frank Miller at x36487.

The internal release is the predecessor of release R1, which is due for delivery in November. That release will be part of DMS operational increment 1, with some updates. OI1, the first piece of flight software for *Freedom*, is scheduled for delivery in September 1993.

DMS is based on a commercial product called LYNX-OS, which complies with the interface specifications for POSIX, or Portable Operating System IX. The operating system will be hidden in much the same way DOS is hidden by Windows. It provides the basic timing and scheduling capability for programs running on the space station's standard data processor.

JSC Photo by Scott Wickes

The team working with the new Space Station Freedom computer operating system shows off the new software in the Flight Data Systems Division's Real-Time Systems Engineering Laboratory. From left are Elizabeth Purcell, Ken Westerfeld, Gretchen Brown, Randy Mitchel, Bill Dwyer, Diana Barber, Andre Allen, Nancy Adams, Frank Miller, Katherine Douglas and Ted Humphrey.

JSC

Ticket Window

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

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

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

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

AstroWorld (valid 1991 season): season, $44.94; child less than 4-feet, $10.12; one day, $15.85; WaterWorld, $8.15.

SeaWorld of Texas (valid 1991 season): child (3-11), $12.25; adults, $17.25.

Six Flags (valid until Nov. 17): one-day, $15.95; child less than 4-feet, $14.95; two-day, $20.95.

Riverraft Trip (July 13-Includes bus transportation, visit to Natural Bridge Caverns or Wild Life Ranch, rafting, and barbecue dinner): $35.

JSC

Gilruth Center News

Defensive driving—Course is offered from 8 a.m.-5 p.m., Aug. 10, Sept. 21 or Oct. 12. Cost is $15.

Aerobic dance—High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is $24.

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

Ballroom dance—Eight-week beginning and advanced ballroom dancing class meets Thursdays from 7-8:15 p.m. starting Aug. 1. Beginning and intermediate class meets from 8:15-9:30 p.m. Cost is $60 per couple.

Aikido—Martial arts class meets Tuesdays for six weeks beginning June 25. Cost is $30 per person.

Fiction workshop—Six-week Wednesday workshop begins June 26. Class is from 6:30-8 p.m., and after class events are from 8-10 p.m. Cost is $80 per person.

JSC

Technical Library News

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

The Art of Communicating: Achieving Interpersonal Impact in Business. Bert Decker; 1988. HD31.C73 D42 1988.

Telephone Courtesy and Customer Service. Lloyd C. Finch; 1987. HD31.C73 F56 1987.

Personal Time Management. Marion E. Haynes; 1987. HD31.C73 H39 1987.

Effective Performance Appraisals. Robert B. Madduz; 1987. HD31.C73 M32 1987.

Team Building: An Exercise in Leadership. Robert B. Maddux; 1988. HD31.C73 M327 1988.

JSC

Dates & Data

Today

Cafeteria menu—Special: Salisbury steak. Entrees: baked scrod, broiled chicken with peach half. Soup: seafood gumbo. Vegetables: cauliflower au gratin, mixed vegetables, buttered cabbage, whipped potatoes.

Monday

Cafeteria menu—Special: beef and macaroni. Entrees: ham steak, Parmesan steak. Soup: chicken and rice. Vegetables: green beans, carrots, au gratin potatoes.

Tuesday

Cafeteria menu—Special: Mexican dinner. Entrees: potato baked chicken, barbecue spare ribs. Soup: tomato. Vegetables: squash, ranch beans, Spanish rice, broccoli.

Wednesday

Cafeteria menu—Special: baked meatloaf with Creole sauce. Entrees: baked scrod, liver and onions, ham steak. Soup: seafood gumbo. Vegetables: beets, Brussels sprouts, green beans, whipped potatoes.

Thursday

Independence Day—Most JSC offices will be closed July 4 in observance of the Independence Day holiday.

July 5

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

July 9

SOAR '91—JSC and the Air Force Space Command's Phillips Laboratory will co-host the Space Operations, Applications and Research '91 symposium and exhibition from 8 a.m.-7 p.m. July 9-10 and 8 a.m.-noon July 11 at the Gilruth Center. NASA and Air Force employees and contractors may attend the exhibition for free without registering for the formal conference. For registration or more information, civil servants should call Jane Kremer, x32601; others should call SEPEC at 282-2223.

SFEI meets—Space Family Education Inc., the non-profit corporation established to manage the JSC Child Care Center, will conduct a special general membership meeting to elect a new board of directors at 4:30 p.m. July 9 in the Bldg. 30 auditorium. The meeting is open to all members of the corporation. For more information or to nominate a candidate, contact Reese Squires at x37776 or Mike Evans at x37667.

July 11

Eclipse viewing—The JSC Astronomical Society will provide telescopes for the safe viewing of the solar eclipse from 1-3:30 p.m. July 11 on the west side of Bldg. 2. Eclipse maximum (about 66 percent) occurs about 2:18 p.m. For more information, call Bill Williams at x33849, or 339-1367.

July 16

Spaceweek—Spaceweek '91, an international week of education and promotion for space activities around the world, will be observed July 16-24. This year's theme is "Look to the Heavens and Learn." For more information, call Spaceweek National Headquarters at 333-3627.

July 20

Loral Run—The Loral Lunar Rendezvous Run will be held at 8 a.m. July 20 at the Gilruth Center. Entry fee is $10 if entry form postmark by July 6, $12 if after July 13, and $15 if after July 14; entry forms are available at the Gilruth Center gym office. Volunteers will be needed. Those interested should contact Len Topolski at 333-5576 or Brenda Clary at 480-0257.

Space Fest '91—The Houston Junior Chamber of Commerce will host a free "Space Fest '91" at 10 a.m. July 20 at the Rice University Memorial Center. The gathering will celebrate Houston's key role in the continuing development of the manned space program. For more information contact Terry Jones 529-2337.

Star gazing—The JSC Astronomical Society will host a Spaceweek Star Party, with telescopes, movies and more, from dusk to 10 p.m. July 20 at Challenger-7 Park. For more information, call Bill Williams at x33849 or 339-1367.

July 22

Spaceweek banquet—Spaceweek will host its annual black-tie national banquet at 6:30 p.m. July 22, at the South Shore Harbour Resort and Conference Center, League City. The keynote speaker will be NASA Deputy Administrator J.R. Thompson. Tickets are $45 if purchased before July 5, $55 after. For more information, call Spaceweek National Headquarters, 333-3627.

Swap Shop

Property

Sale: LC 3-2-2, no MUD taxes, assume, no approval, $62K. 538-2299.

Rent: Lake Livingston, waterfront, 3-2, C/AH, FPL, covered deck, pier, furn, wknd/wkly. 482-1582.

Rent: 6.1K sq ft, cath ceilings, pool, Jacuzzi, $650/mo. 333-7071.

Sale: Dickinson, 3-2-2, avail Jul. x38078 or 538-1217.

Sale: Baywind I condo, 1-1, FPL, all appl, $27.9K OBO. Carla or Paul, 488-0550.

Sale: Baywind I condo, 2-2, FPL, split floor plan, W/D conn, Jim, x33821 or 554-4357.

Sale/Rent: El Dorado Way condo, 1-1.5-CP, W/D, alarm, FPL, fan, patio, pool, $525/mo or $38K. 486-0508.

Rent: Lake Travis cabin, priv boat dock, C/AH, accom 8, wkly/dly $425/$85. 474-4922.

Rent: Lake Tahoe condo, furn, 2BR, sleeps 6, Sept 9-16, $425, 474-5610.

Sale: Egret Bay condo, 2-2, cov parking, appl, waterfront, FPL, fan, patio, storage, pools, boat ramp, $42.9K. x30092 or 481-3637.

Sale/Rent: Santa Fe, new 14'x20' building, can be relocated, $200/mo. Larry, x30428.

Sale: Santa Fe, 3-2-2, fenced on one restricted acre, FPL, $124.5K. (409) 925-8760.

Lease: Webster/Ellington, 2-1 condo, extras, $435/mo. Dave, x38156 or Herb, x38161.

Lease: El Lago, 4-2-2, formal LR/DR, den w/corner FPL, fenced yd, avail Aug 1, $995/mo. Sylvia, 488-7363.

Lease: El Lago, 4-3-2, formal LR, den, fenced yd, avail Aug 1, $900/mo, plus dep. 353-2893.

Sale: Bayou Vista, west bay lot, good bulkhd, $5.9K. 339-1957.

Sale: Nassau Bay townhome, comp remodel, $59,950 OBO. 333-4689.

Sale: Nassau Bay townhome, 3-2-2A, FPL, atrium. Vince, 282-3497 or 333-5598.

Rent: Friendswood, enclosed RV storage stall, 40' deep, lights/power, reasonable. 482-9396.

Sale: LC, lot 50'x100',was $15K, now $13K. Fulton, x31663 or 334-1090.

Sale: Camino So, 3-2-2A corner, lg den w/FPL in brick accent wall, island kitchen, ceramic tile floor, oak cabinets, Saltillo tile patio w/trellises, $74K. x33335 or 326-2582.

Lease: CLC, Pipers Meadow 3-2-2, DR, FPL, gas util, fence, patio, new carpet, $795/mo. 482-6609.

Sale: Hunt, TX, 3-2 waterfront, 2200 sq ft, 900 sq ft decks, cathedral ceilings, $120K. 280-8792.

Sale: Bay Glen, corner lot, 1-1.5 story, 3BR, den, formal LR/DR, marble entry, FPL, $125K. 480-4469.

Sale: Bay Glen, 4-2-2, cul-de-sac, lg lot, spa, formal LR/DR, fans, $123K. 488-8672.

Lease: Heritage Park, 3-2-2, FPL, formal DR, no pets, $875/mo. 282-2787 or 532-1240.

Sale: Lake Placid, near Seguin, 90' waterfront lot, 3-2-2 rock house, 600 sq ft dock, $93K. 488-7387.

Cars & Trucks

'83 VW GTI, blk, AC, sunroof, roof rack, port Sony. Andy, x32503 or 334-2647.

'86 VW GTI, blk, 5 spd, A/C, sunroof,new brakes/tune up, AM/FM/CD, $4K OBO. Scott, 282-3985 or 286-3922.

'87 Nissan Maxima SE, blk, 46K mi, custom wheels w/locking hubs, loaded, alarm sys, $10K OBO. Tamara, 282-4455.

'87 Toyota MR-2, 33K mi, white. 5 spd, sunroof, spoiler, ex cond, $9.5K OBO. Mike, 283-5579 or 332-1617.

'76 Olds Toronado, 31.5K mi, ex cond, $2.5K. John Kidd, x35561.

'90 Sunbird SE, sunroof, rear spoiler, auto, tilt, AM/FM/cass, ex cond, $9K OBO. Tammie, 280-2257 or (409) 925-1802.

'80 Mercedes 300D Turbo, ex cond, loaded, pwr sunroof, leather etc, 100K mi, $8.4K; '85 Chevy PU, V-8, good cond, loaded, low mi, $3.8K. x37750 or 996-6914.

'89 Chevy Corsica, A/C, AM/FM, low mi, $7.K. David, 282-3972 or 488-4207.

'79 BMW 320I, 4 spd, wht, 2 dr, $2495. 559-2858.

'85 Pontiac 6000 LE, ex cond, low mi, AM/FM, A/C, cruise, $3.7K OBO. 333-4836.

'79 Toyota, 4WD PU, good eng/trans/mechan, $1.5K. Bob, x34409 or 393-1670.

'79 Malibu, 4 dr, new tires, 86.7K mi; '66 Plymouth Fury III, 2 dr, ex body, needs eng overhaul, BO. 488-2497.

'68, '69 Corvette, both orig and good cond, auto, A/C, $6.5K ea. Albert, 583-8737.

'89 Honda Civic LX, ex cond, new tires, A/C, pwr windows/drs, AM/FM/cass, $8.5K. Jay, x35814 or 992-3149.

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

'71 VW van, rebuilt eng/brakes, good cond, $2.1K. Bill Huber, x30039 or 332-9044.

'88 Mitsubishi Precis, 3 dr, 5 spd, AC, AM/FM/cass, good cond. $3K. Phil, 333-7070 or 482-2342.

'86 Nova, gray, A/C, AM/FM, 5 spd, good cond, $3.5K. Rob, x36441.

'89 Mazda MX6, 11.5K mi, ex cond, 15/mo warr, $9450 OBO. Blaine, x32765 or 480-1967.

'84 Cadillac Fleetwood d'Elegance, ex cond, 65K mi, $5K OBO. 529-6914.

'80 Mazda 626, ex cond, 4 cyl, gold, Pioneer stereo, $1.9K. (409) 925-8081.

'81 VW PU, diesel, 4 spd, 108K mi, AM/FM, new tires, ex cond, $1850 OBO. Bitsey, x34834 or 946-6451.

'81 Chevy Camero, good tires/batt, needs wk, $650. Steve, x35923 or 538-2169.

'88 Cutless Supreme Int, 2 dr, 2-8 liter multiport FI, 5 spd, all elec, pwr seats, blk, 45K mi, $8.3K. Kirk, 282-2911 or 332-5876.

'85 VW Vanagan GL, ex mech cond, $4.8K. Bob, x32743 or 335-1865.

'78 Dodge van, 6 cyl, 3 spd, good clutch/brakes, hvy duty trlr hitch, $1.4K OBO. Steve, 282-3191 or 992-2841.

'78 Trans Am, 23K mi on rebuilt 400 eng/trans, auto, orig paint, no rust, good cond, new dual exhaust rear tires, $2.3K. 480-4839.

'71 Mustang, 6 cyl, new paint/tires, needs minor wrk, $3K OBO. Tiffiny, 283-5680 or George, (409) 938-8911.

'66 Classic Chevelle, 4 dr, runs good. 332-8558.

'84 Nissan 300ZX 2+2, auto, A/C, stereo, $5,650; '80 Pontiac Phoenix V6, auto, A/C, stereo, $1,950, sell one, not both. x30092 or 481-3637.

Cycles

Yamaha RZ350, Kenny Roberts rep, prof eng porting, Mikuni carb, pipes, K&N jet kit, Dunlop rad, w/bike cov/helmet, $1995 OBO. Hugo, 286-0432 or 335-2552.

'80 Puch Moped, 2 spd, runs great, $200 OBO. Andy, x32503 or 334-2647.

'85 350X, Honda 3-wheeler, ex cond, $950, 479-2671.

'82 Honda, FT500, runs good,new tires/chain, needs new starter, helmet incl, $650. Terry, 282-3883 or 474-5639.

'79 Yamaha, XS1100, shaft dr, disk brakes f/r, 16K mi, fairing, ex cond, $900 OBO. Wally, x36440 or 326-2664.

Boats & Planes

Sensenish 74 DM6-0-58 aircraft prop, overhauled, yellow tagged, fits some Beech, Piper, PA-18, PA-22, PA-28 series aircraft, $900. 538-2299.

Loran, Sitex, Koden C navigator, $175 OBO; slalom ski, O'Brien tournament, 66" titanium core, $160, ex cond. 554-2728.

25 hp Evinrude, elec start, new, $1.4K. Jerry Craig, 283-5311 or 420-2936.

'85 Checkmate ski boat, 350 Merc dr 260 hp, custom trlr, ex cond, $8.5K. Curtis, 450-3146 or Randy, 333-6568.

'70 Coronado 25, new mainsail w/cover, 2 jibs, depth sounder, compass, 7.5 hp O/B, w/controls, good cond, $5,500. John, x3-0217 or 484-0395.

'84 Mark Twain, 19', open bow, 200 hp, I/O Merc, good cond, $4,295. 480-9159 or 488-9080, x3661.

23' Sportcraft boat, 2.6 liter OMC Sea-Drive eng, w/trlr $4.5K. 474-3077.

'79 Pearson, 23', w/4 sails, autopilot, 9.9 O/B w/elec strt, VHF, AC, 2 anchors, head, stove, shore pwr, extensive invt, ex cond, $9,500. 479-4963.

New, hard back copy of "Flying VFR in Marginal Weather," 3rd edition, by Daryl E. Murphy, McGraw Hill, 1991, $25. 532-1072

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

'83 Hunter 34' sloop, Westerbeke diesel, furling jib, VHF, D/S, K/M, A/C, stereo, ex cond, $44K. Dale, 334-3393.

'77 J-24 racing sailboat, restored, new hardware, rigging, rudder, keel faired to min, trlr coated w/zinc and paint, 4 hp Evinrude, $12.5K. David, 929-7120 or 332-9044.

Audiovisual & Computers

NEC 286 8 MHz PC, 640K on mother board plus exp card w/2Mb installed, 20 MB HD, 1.2 MB and 360K FDs, math coprocessor, optical bus mouse, EGA w/multi-sync monitor, DOS 3.3, latest NEC BIOS, will sell as unit or indiv parts. 480-6797.

Software, games for Commodore 64 computer, w/doc, joy stick, BO. Bob, x36527 or 482-6730.

Casio BOSS, SF8000 electronic scheduler, new, $100. David, 334-2766.

IBM XT computer, 640K memory, 30 MB HD, 2 floppies, color monitor, $975. x36290.

Commodore 128 PC, 1571 FD, 1902 color video monitor, joy sticks, games, 128 also runs 64 mode, $350. Edward, 486-1093.

IBM computer, prtr, monitor, 20 MB HD, $900. 333-6009 or (409) 935-4950.

Commodore 128-64 computer, color monitor, disk dr, prtr, SW incl, $550. 286-8417.

PC Tools Deluxe 6.0, new, 5.25" and 3.5" disks, incls data recovery, HD backup, DOS shell, desktop manager, $50. x30852.

Kenwood home stereo, KRV 77R receiver, 70 watts per channel, $140; Sony CD car stereo, pullout, $300. Eddie, x34580.

IBM compatible 286 AT, 32 MB HD, 1 MB Ram, 1.2 MB & 360K 5.25" FDs, 2 ser ports, 3 para ports, 1 game port, 101 keybd, 14" CGA color monitor, Epson FX85 prtr, some SW, $795. 482-8998.

Commodore 128, 1581, and 1571 drives, Star 1000 , 1526 printers mouse, modem, 50 disks, 1000 programs, $550 all or part. Rick, x33856 or 488-3527.

Apple IIc, w/1 MB, $300, Sony Trinitron tv/monitor, $250; 3.5" disk dr, $100; Imagewriter, $100; Plotter, $100, acc/SW. 992-1661.

Grundig premium hi-fi stereo, 4 spks, turntble, cass, amp. 992-1466.

Seagate HD, 20 MD, 3.5", MFM, $125. 474-2654.

Musical Instruments

Clarinet, Le Blanc, Normandy, ex cond, $150. 554-7083.

Two keyboard Wurlitzer organ, $100. 534-4957.

Gibson elec guitar, ex cond, w/case Ibanez dist pedal, Crate G-10XL amp, $250 OBO. Kris, 559-2325.

Yamaha studio piano, black lac finish, $3200. 483-5297.

Pets & Livestock

Baby hand-fed cockatiels. Linda, 484-7834.

Free: Doberman/Shepherd mix, 2 yrs old. 644-2616.

Free: Tibetian Terrier, 10 mo old. Shelia, 334-3959.

Free: yellow lab puppies, born 5/5/91. Scott, 280-0469/(409) 935-6605.

Free: fuzzy, frisky kittens. Rebecca, x37441.

Free: blue-grey tabby kitten, litter trained. Terry, 282-3883 or 474-5639.

Chestnut Gelding, 15.3 hands, Hunter/English exp. rider, $2.5K OBO. 333-0989 or 482-1376.

Free: Tabby male, 3 yrs, neutered and declawed. 333-7150 or 488-5284.

Household

Kenmore port DW, $250; toaster over, $20; full size head/footboard, $75; antique dresser, $400; buffet, $350. x36776 or 645-6890.

Frigadaire refrig, lg upper/lower drs, ice/water dispensers, ice maker needs repair, $300. 482-1582.

Wicker dinette set w/4 chairs, $300 OBO. 480-6913.

DR table w/chairs, $85; VCR w/cable, $70; sm student desk, $12; 4 poster hdboard and bed frame, $50. 333-6204 or 996-6731.

Hat and umbrella tree, 5' tall, $25; 28" rnd marble table w/2 chairs, $95. 326-2221.

Lg red velvet afro love seat w/matching lg arm chair $2.9K. 326-2221.

Blue Queen Anne settee, $90; china cab, lighted glass drs, $300; matching buffet, $200. 644-2616.

King sz bed, $75; matching chest of drwrs, $25; Weber covered BBQ, $25; sofa bed, $400; coffee and 2 end tables, $100. 333-5179.

Queen sz waterbed, padded side rails, bkshelf hdboard, htr, ex cond, light oak, $100. Eileen, 244-9730 or 484-0958.

New GE Space Saver microwave/vent a hood combo, never used, $250 OBO. 339-1337.

18 cu ft Whirlpool refrig w/ice maker, white, $150. 480-5130.

Queen sz waterbed, htr, 10 drwr storage pedestal, was $500, now $100. 337-6406 or (409) 849-3791.

BR suite, 3 yrs old, inc queen sz bed, 3 drwr dresser w/hutch/mirror, 2 nightstands and tallboy chest of drwrs, $100 OBO. 282-4532 or 286-8524.

Couch and love seat, ex cond, $100 OBO. 282-4736 or 286-8524 after 5 pm.

Papa san couch, $100; 4 poster waterbed, $350. 996-9632.

2 end tables, coffee table, $60 each, OBO; rower/ exerciser, $75 OBO. 482-7607.

Bunk beds w/matt, chest, new, l-shape sleep and dress center, was $780, now $340; new wood desk w/chair, $69. 337-5868.

7 pc dinette, 6 wood/padded seat chairs, 5' table w/wood tressel, laminate top, was $329, now $210. 337-5868.

2 yr old sofa and love seat, $350 OBO, great cond. Lisa 282-5255.

Stratford sleeper/sofa, rust, good cond, $170. Mike x34710.

Playpen, sm, good cond, $35. Mike, x34710.

Contemporary sofa and matching chair, beige, brown, white, $200. Robert, 483-3742 or 554-6631.

Port-a-crib w/new matt, ex cond, $45; wedgewood china, white, embrossed Patrician pattern, 40 pc, $225; dollhouse kit, "San Francisco" townhouse, $50. 486-0898.

Stratford couch and chair set, $300; coffee/end marble inlay tables, $100/ea; Curtis Mathis stereo/ radio/record changer, $75. 488-3588.

Dinette table w/4 chairs, bronze smoked glass top, 48" dia, $115. Tony, x35966 or 488-3238.

BR set, full sz bed incl matt/box, mirror dresser, 6 drwr dresser, nightstand, good cond, $900 OBO. Tandy, 488-5970 or 286-3019.

BR suite, antique green, full sz, mirror dresser, 5 drwr chest, 2 nightstands, $700; GE D/W, built-in w/pot scrubber, almond, 10 yrs old, needs adjust, $70. Magdi Yassa, x38470 or 486-0788.

Couch, chair w/ottoman, $200; full sz bed w/hdboard, new matt, $65; rattan glass rectanglular coffee table, $30; rattan rnd dinette w/4 chairs, $230; brass coat rack $5; brass cedar cubed chest, $20, all for $500. Rob Kelso, x35483 or 480-2997.

Contemporary BR suite, incl triple dresser/mirror, pier cabinets and lighted bridge, full/queen bkcase hdboard, no matt or frames, $750. 483-5297.

Photographic

Nikonos IV, under water camera, equipped w/Nikor 35 mm f2.5 lens, new cond, $250. David Cree, x38370 or 471-3256.

Mamiya RZ 6x7 polaroid back, $200; motor winder II, $200; Minolta Maxxum 35-135 mm (Sigma), $100; Maxxum 7000 EP-7 and BP-7 battery packs, $10 ea; Maxxum 7000 case, $10. 282-3517 or 482-4247.

Minolta XE5, 35 mm SLR, 1.7 50 mm Rokkor lens, 80-200 mm mitakon mc zoom lens, Vivitar auto 2600 Flash, bag and access, all $250. 481-6172.

Penta-X ME super 35 mm SLR w/50 mm F1.4 lens and 35-175 mm zoom w/macro lens also incl Vivitar flash and carrying case, all $150. 482-3428.

Wanted

Want Nintendo games. Jerry, x37486 or 545-8325.

Want carpool from Alvin (FM517 & 35), non-smoker, alternate driving or pay for gas. Scott, 283-5611.

Want roomate for 2+2 home on Galv bay, $250 a mo plus half util, no child, avail June 29. Fran, 333-6277 or 339-3562.

Want inexpensive car or truck, no rust buckets, repairs on mech sys ok. 339-1337.

Want Children's Construx Plastic construction kits. Jim, 337-2838.

Want good used brick, fair price. 480-3424.

Want roomate to share 4 bedrm house in Friendswood, $330 mo incl rent and util. 996-1933.

Want non-smoking roommate, no pets, share 2-2 condo on El Dorado, WD, tennis ct, wt rm, $250 mo plus half util. Kory, x37623 or 996-5327.

Want to form carpool San Leon to Nasa. 339-3278.

Want full set of golf clubs, irons, and/or woods, good cond. James, 333-7174.

Miscellaneous

Fender Rhodes elec piano, $150; Peavy 8 channel mixer, $300. Jim, 333-7690 or 947-1963.

Infinity Quantum Jr speakers, 12" 3 way, $200 OBO; Recoton MTS TV stereo decoder, $100 BO; Connelly comp II water ski w/carry case/vest, $100 OBO. 997-2069.

Windsurfer, Kerma Osprey, 11', ASA, 185 liters, multicolor full batten 4.7 sail plus 4.0 learner storm sail, $500; tulie car racks w/short roof line kit, $100; Sailboat stanchion racks, $30. Lili, x30962.

16' Alum V-bottom Lone Star boat w/trlr, 9.9 Johnson motor, 0 hrs on power head, $500; Seaguil sailboat motor, $100. Jim 554-2063 or Claudia 244-9643.

Boy's Schwinn bicycle 21", $50. 332-1725.

'76 BMW R-75 motorcycle, stumpjumper mountain bike, $1.1K. 996-9191.

Man's Raleigh Pursuit, 12 spd, quick release front wheel, ex cond, $225. Marie, x30898 or 488-5614.

'85 Blue Honda Elite 150, 1197 mi, ex cond, $550; 30mm Minolta f1.2 lens w/case, new, 488-1785.

'90 Rascal 200 elec scooter w/trunk lift, new $2K. 488-1262.

Ski machine fitness master, calibrated dial provides variable leg resistance w/sturdy ss cable, sturdy chrome-plated arm poles w/push-button height adjustment and indiv resistance settings, was $350, now $150. 480-6797.

Hvy duty custom wkbench, w/4 drwr, shelves, back pegboard, overhead flourescent light, vise, wired for elec, $350. x35125 or 286-8650.

'71 5th wheel travel trlr, all alum, self contained, good cond, $2.9K. 476-9092.

Seiko comb analog/digital watch, blk/gold, many func, ex cond. $75. 554-2727.

Alaskan fishing trip. 1-545-9511.

New gold watches, one blk face w/2 diam, was $150, now $110, one w/diams circling face, was $260, now $175; three sofa, ex cond, chairs, console TV, W/D, desk, coffee tbls, end tbls, gas stove. 282-4507 or 458-8350.

AT&T answering mach w/remote message, $40; Canon T-50, used little, $150; bike rack for two, $30. Tamara, 282-4455.

President & First Lady all incl, life time charter gold membership, $1.5K OBO. 532-3507.

Wooden monk's chairs, $49/pr OBO; sheepskin seat covers, bucket seats, $35/pr; man's 10 spd bike, $19; will trade king mattress for queen; computer books. 337-3406.

Quality weight bench +150 lbs cast iron wt set, $100. Mark, x31443 or 480-9229.

Taylor made 9.5 tour burner w/HM40 gold shaft, $125; ladies taylor made 12 degree driver, like new $75. 487-1654.

Bimini top for CJ-7 Jeep, blk, as new $50. 644-2616.

Luggage Royal 3 pc, bright pink, $75; Am Tourister 2 pc, brown $50, or $115/both; new stainless steel kitchen sink, $25. x32896 or 538-1443.

Riedell men's blk ice skates, new, sz 7, $90; girls white Riedell ice skates, new sz 1.5, $80. Bill, x38574.

Riedell men's blk ice skates, new, sz 7, $90; girls white Riedell ice skates, new sz 1.5, $80. Bill, x38574.

Turboman oriental rug, 4x6, red/blue, $950; lg wooden baby cradle, $45; Dahon folding bicycle in bag, 3 spd, $75; Sears port washer, like new, was $399, now $200. Stan 339-1152.

ULTRAX radial GTS tires, raised wht/letters, P225/70 SR15's, $100. 554-2267.

15", 5 bolt mags w/mounted Eagle GT tires, fits Ford, set/$300. Hugo, 335-2552 or 286-0432.

Marantz stereo center, $300; 19" remote color TV, $150; dinette set, $300; bench wts, and bag, $100; men's 40L suits, $50/ea. 333-5179.

Sears Healthmaster, manual treadmill, new w/digital readout spd/distance/time/calorie burn, $100. x32010 or 554-6743.

Coleman camping tent, canvas, new, $99 OBO. Joe, 944-4581.

4 ton auto air jack, $250. 339-1957.

Saltwater aquarium, 40 gal, w/stand, light, glass top, Eheim filter, $275 OBO. Crystal, x35711 or 480-4821.

Saltwater aquarium, 75 gal, w/stand, Eheim filter, htr, coral access, ex cond, $550; Marcy Monster wt bench, w/ext bars, ex cond, $55. 483-9552.

10" Rockwell tbl saw, 2 hp motor, ex hvy duty for commercial use, $100 OBO. 339-1337.

Dan Wesson .357 stainless 8" barrel, w/4x Burris L.E.R. scope, shoulder holster, $150. David, 282-1972 or 488-4207.

RAM Traditional golf clubs, 3 PW, new grips, ex cond, $100 OBO. Rich, x34818.

4 Chevy 14" Rally wheels w/rings and centers, 2 have tires, $50. Wayne, x32568 or 486-7141.

5' x 15' x 6' dog run, $100; 50' roll of 6' chain link fence, $50; king sz matt/bx springs, $50. Bruce, 431-2296.

Hickok Model OS-121C Navy Oscilloscope w/spare parts $100. Jim, 554-2063 or Claudia, 244-9643.

Mazda RX7/12A side draft intake manifold and Weber 45 DCOE. $300. Bob, x32350.

Ping Irons, golf clubs, 2-9 plus PW and SW, like new, $400. 482-7643.

King sz waterbed, $50 OBO; 2x Bayonet mount teleconverter for 35mm camer, $20; fry daddy, boxed, $10. Sharon or Mike, x38451 or 554-4016.

Antiques: wheel chair, wooden, back, seat, armrest, and footrest; sewing machine; lighting rods. Ruby, 783-9164.

Treadmill non elec spd, distance, timer, tension. $85. 333-7180 or 333-9581.

Moving boxes, $1 ea. x38711 or 538-1642

Fisher Price baby bathtub, ex cond, $10. Sharon, 480-2646.

Wurlitzer organ, backup rhythem sec, lerner cass/tapes, three keybds, $600; designer bar, wine rack, two locking cabinets, marble top, mirrors in front, dark walnut finish, two stools, $500. 532-2158.

Turbo 400 auto trans, good cond, $75; Briggs engine lawnmower 3.5 hp, rear bagger, used 4 seasons, bags incl, $75. 280-0850.

Singer sewing chair and cabinet, was $2K, now $200. 488-2101.

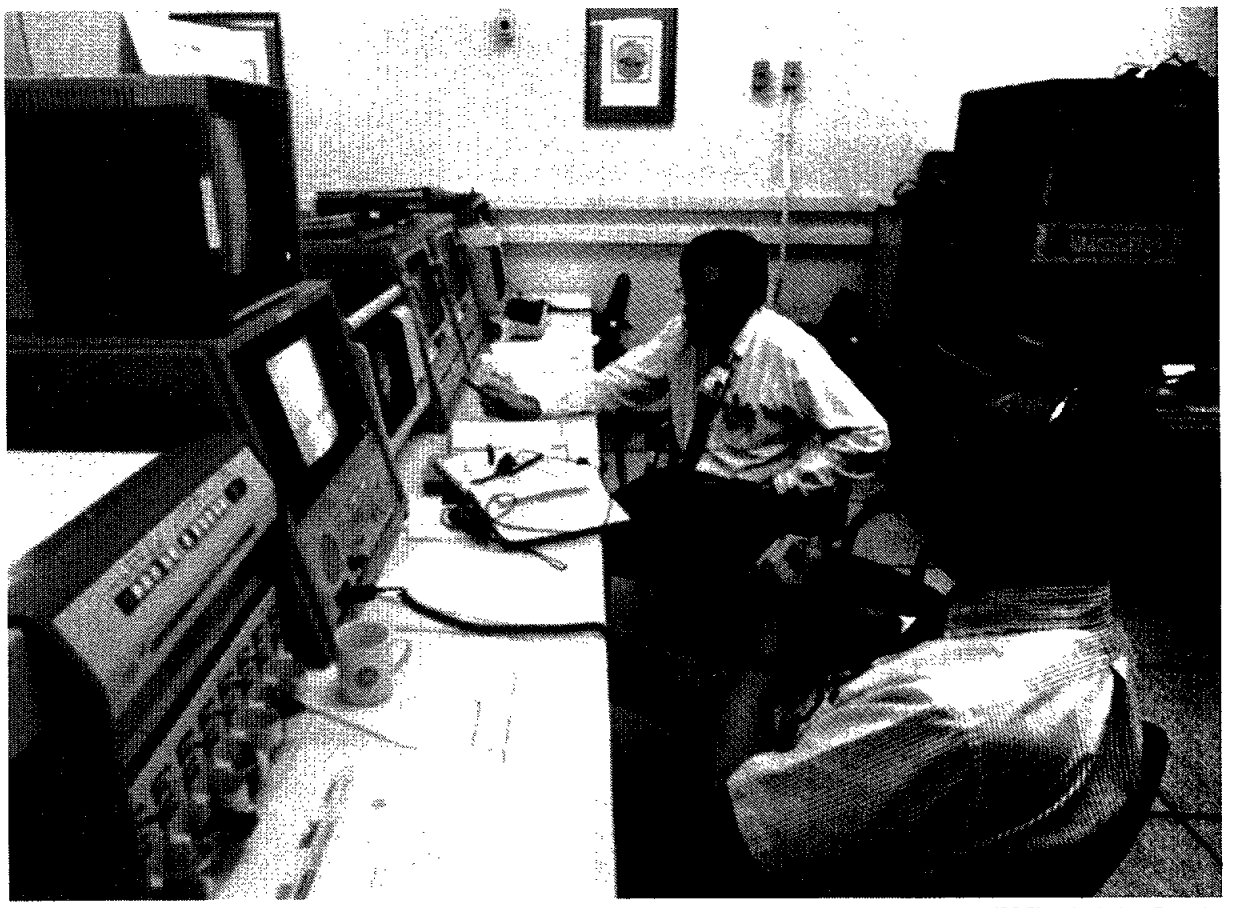
Sears Beta VCR, 21" TV; Honda lawnmower; Craftsman edger; Sony cassette video recorder/player; Kenmore W/D; GE 19" TV. 996-9191.

Delta 10" motorized industrial miter saw w/freud 60 tooth carbide blade, $175; sofa sleeper, ex cond, $200. 486-7054.

Nelco sewing mach, hvy duty, access, manual, in finished floor stand, w/folding lip. $275. OBO. Glenn, x38673 or 480-2900.

Exceeding Expectations

Quality science data indicates SLS-1 success



JSC Photo by Andrew Patnesky

By Kari Fluegel

Many adjectives could be used to describe the success of the Spacelab Life Sciences-1 mission, but Mission Scientist Howard Schneider uses only one.

"Outstanding."

"All the investigators — the human and the animal investigators — were extremely happy with the results," Schneider said. "The mission met and exceeded the investigators' expectations."

SLS-1 was the first space shuttle mission dedicated solely to life sciences research. The 18 life science experiments focused on the human body's adaptation to the microgravity environment of space and studied the cardiovascular, cardiopulmonary, musculoskeletal, immunological, metabolic and neurovestibular systems.

These systems display the most pronounced changes in space flight, Schneider said.

SLS-1 also was the first Spacelab mission managed by JSC.

"With everyone that I have been able to talk to... all were extremely happy with the amount of data and the quality of data," Schneider said.

C. Gunnar Blomqvist, principal investigator for "Cardiovascular Adaptation of Zero Gravity," said SLS-1 went extremely well and credits the efforts of the crew members for the quantity and quality of the data.

"We had a very large data stream and it's good quality data," he said. "The crew did an absolutely tremendous job of getting everything done."

One of the many bonuses of the flight was that more crew members than planned were able to participate in several experiments, thus improving the statistical significance of the information.

Dr. Dwain Eckberg, principal investigator of "Influence of Weightlessness Upon Autonomic Cardiovascular Controls," said the significance of the results seen in his experiment was enhanced greatly by the participation of the three orbiter crew members as well as the four payload crew members.

"We got excellent data," he said.

Eckberg added a quick look at his data confirms the hypothesis that the body's baroreflex function — the normal reflex system that regulates blood pressure — deteriorates during space flight.

Pre-mission planners earmarked several activities in case in-flight anomalies deleted some of the scheduled experiment activities. However, there were no problems that seriously hampered the data gathering and crew members were able to conduct the reserve activities anyway.

Crew members also were able to collect body mass measurements and urine samples from all seven astronauts — again more than planned pre-flight.

"To date this is the most complex investigation on the renal-endrocrine system ever conducted on a space flight crew," said JSC's Dr. Carolyn Leach-Huntoon, prinicpal investigator for "Fluid-Electrolyte Regulation During Spaceflight. "This crew is the first where we were able to collect these important metabolic samples early in flight."

Crew members also completed all the essential blood draws during the flight. Many of the draws were time-critical due to the use of tracers that will allow investigators to track their course as they are metabolized by the astronauts, Huntoon said.

The eight animal experiments also went extremely well, according to Dr. Ken Baldwin, principal investigator for "Effects of Zero Gravity on Biochemical and Metabolic Properties of Skeletal Muscle in Rats."

"Based on the general vibes from the investigators, things look quite promising," Baldwin said.

Early analysis shows the general muscle tone of the animals were compromised during spaceflight, he said. He added that tests indicate the amount of time it takes the muscle to recover upon return to Earth is greater than the time spent in space. Analysis will continue over the next few months.

A few anomalies did appear during SLS-1, but those were overcome. Early in the mission, the Gas Analyzer Mass Spectrometer experienced some problems, but Schneider said they were not unexpected.

The GAMS was used to analyze crew members' inhaled and exhaled gases for three experiments. GAMS are sensitive, if not temperamental, instruments even on Earth due to the difficulty of maintaining a vacuum, he said.

Knowing this, mission managers manifested a back-up GAMS which was put into use so crew members were able to conduct test procedures later in the flight.

Problems with the Spacelab freezers warming were managed by switching blood and urine samples from one unit to the other. The procedure worked very well and all the samples were returned in a scientifically valuable condition, Schneider said.

Columbia may be back on Earth, but SLS-1 is not over. Crew members will go through several post-flight tests over the next few months to track how their bodies readapt in the long-term.

Investigators, however, have begun the momentous task of shifting through the mountains of material harvested from the seven astronauts, 29 rats and 2,478 jellyfish.

Some of investigators have made some early speculations about their findings based on the data seen, but all are cautious about making assumptions this early in the analysis stage.

More than 200 individuals from around the world are participating in the science data analysis.

Schneider said investigators will give a quick-look report in about a month to be followed by a 90-day report later this year. Findings should be ready for publication in about a year, he said.

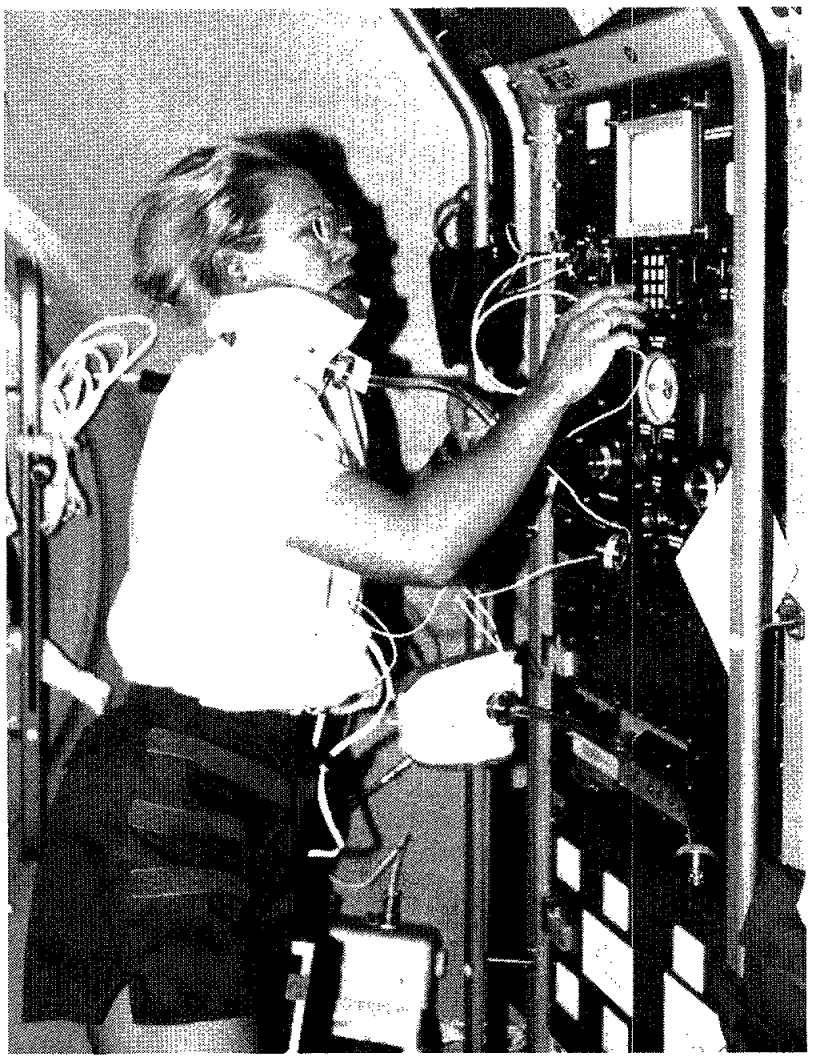
About 200 papers already have been published regarding the research done in preparation for SLS-1.

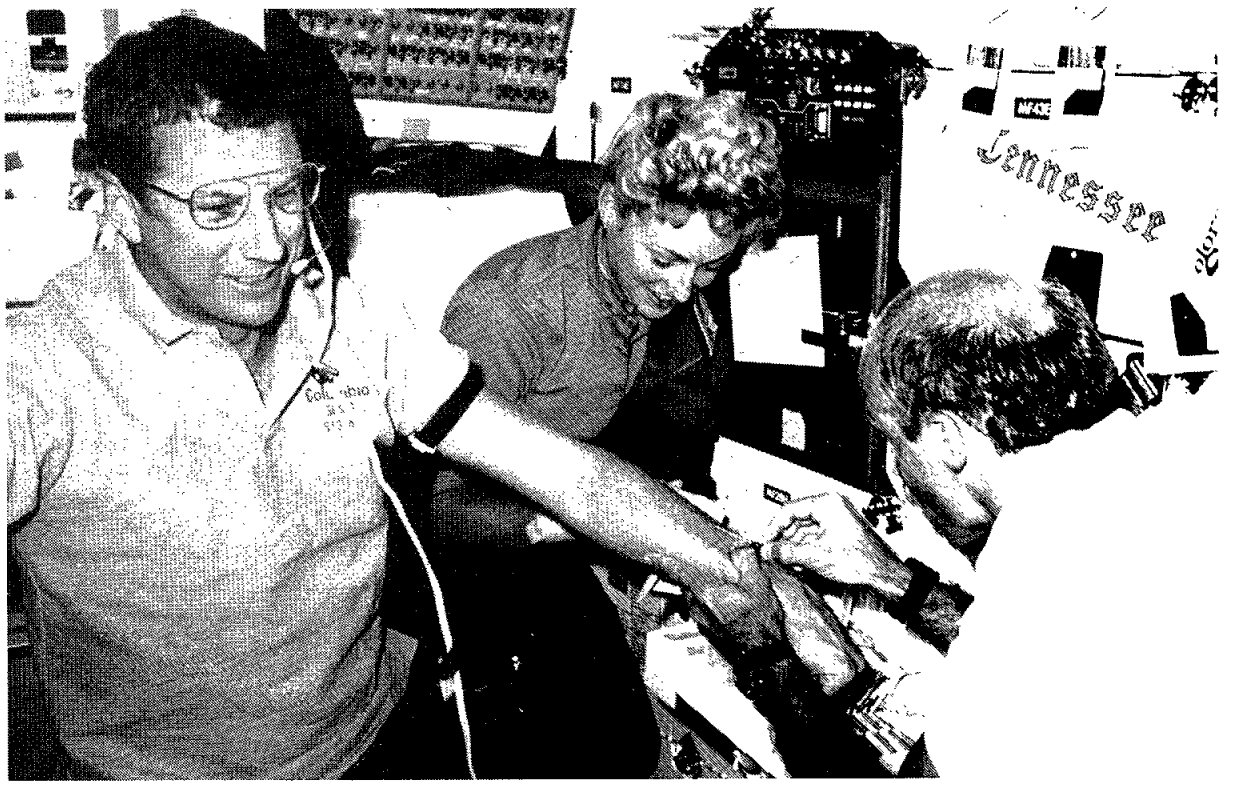
Investigations into the body's reaction to microgravity will not end with the publication of the SLS-1 findings.

SLS-1 will be followed by International Microgravity Laboratory-1 mission in February 1992, the Japanese Spacelab mission in September 1992, a second European Spacelab mission in February 1993 and SLS-2 in June 1993.

SLS-2 will repeat most of the human experiments to increase the sample size and statistical significance, Schneider said. The experiments will be adjusted slightly, based on what investigators have learned from SLS-1.

"I am absolutely delighted for the agency that everything worked out so well," he said.

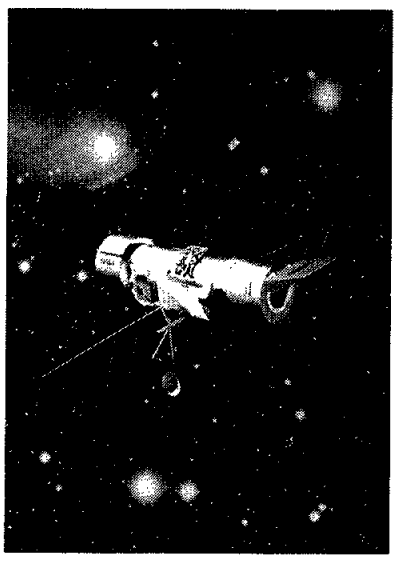




NASA Photos

Top: Dr. John West, right, and Dr. Gordon Prisk watch data coming down from *Columbia* for their SLS-1 experiment "Pulmonary Function During Weightlessness" in the Science Monitoring Area at JSC. Left: Mission Specialist Rhea Seddon takes baroreflex measurements in the Spacelab. Above: Payload Specialist Drew Gaffney, left, holds still while fellow crew members Millie Hughes-Fulford and Jim Bagian draw blood.

First Advanced X-ray Astrophysics Facility mirror shipped



The first mirror for NASA's Advanced X-ray Astrophysics Facility space observatory has been completed and shipped, and the second won't be far behind.

Hughes Danbury Optical System of Danbury, Conn., shipped the first of AXAF's 12 mirrors June 12 to Eastman Kodak of Rochester, N.Y., for assembly. The mirror will be paired with another already in its last polishing cycle, which should be shipped by Sunday.

The shipment of the mirrors marks the culmination of a challenging 2 1/2 years for the AXAF program. The emphasis during this initial phase has been to produce the first set of mirrors and validate the manufacturing process. The most sophisticated activity was development of the highly complex measuring (metrology) stations, used to characterize the mirrors and guide the polishing activity. AXAF will use six nested pairs of mirrors to obtain high resolution x-ray images of the universe.

Based on preliminary data, the first mirror pair has an angular resolution of 0.37 arc second, better than the 0.5 arc second resolution objective. The expected on-orbit accuracy will better by a factor of 2 due to weightlessness. The smaller the resolution, the more distinguishable are the distant x-ray sources.

During the fabrication of the first two mirrors, extreme care was exercised to ensure that the mirrors are shaped correctly. Several cross checks were used to validate the process, including comparative analysis across metrology stations, self-consistency checks and end-to-end x-ray testing.

One such cross check detected a minute error of 0.03 arc seconds in resolution, which was traced to a single sign reversal within the more than 200,000 lines of computer code used for metrology analysis. This discrepancy already has been removed in the second mirror.

The AXAF team, comprised of Hughes Danbury; Marshall Space Flight Center; Smithsonian Astrophysical Observatory, Cambridge, Mass.; and TRW, Redondo Beach, Calif., is extremely pleased with the excellent quality of this first mirror set and the demonstrated capability of the metrology system.

AXAF is the x-ray component of NASA's Great Observatories program and is tentatively scheduled for launch in the late 1990s.

JSC receives humanitarian 'Academy Award'

JSC recently was honored by the "Academy Awards" of science, engineering and technology for its affirmative action activities.

Dr. Joseph D. Atkinson, director of the Equal Opportunity Programs Office, accepted the Humanitarian Award on behalf of the center.

The awards program was sponsored by the National and Greater Houston Area Technical Achievers Academy, a project of the NTA Houston Chapter.

In total, 18 awards were presented at the April event.

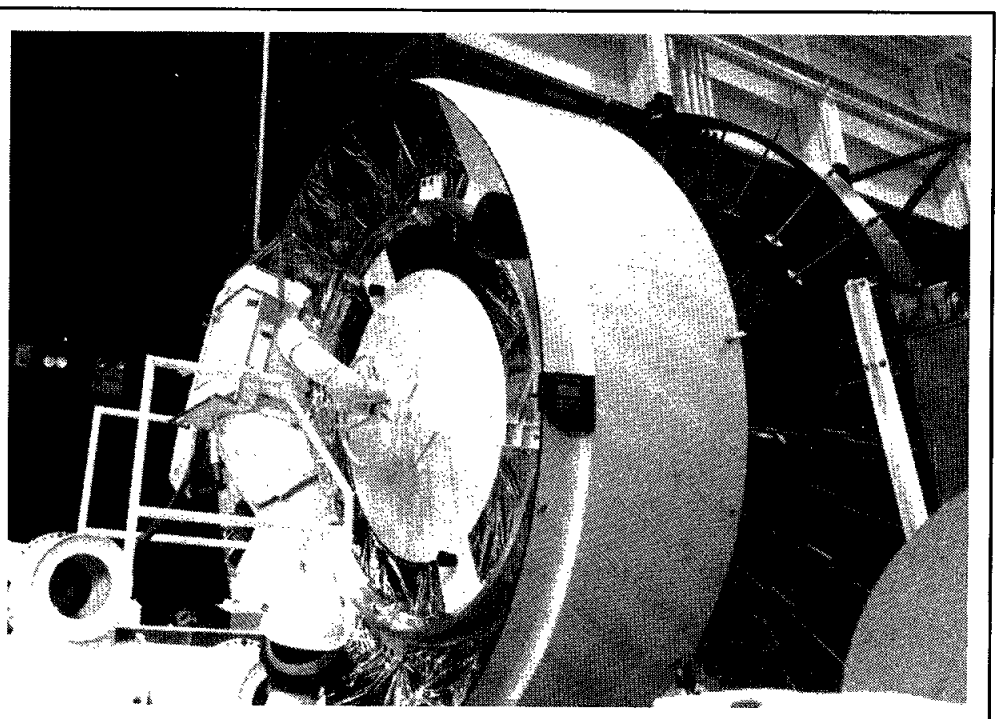
Experts to examine space policy debate

A panel of space experts will tackle the space policy implications of the latest studies and the space station debate at a Spaceweek public policy forum sponsored by the American Institute of Aeronautics and Astronautics.

The forum, called "At the Threshold: Impacts of the Augustine Committee, Synthesis Group and Space Station Debate on America's Future in Space," will be at 11:30 a.m. July 18 at the Gilruth Center.

Confirmed panelists include JSC Director Aaron Cohen; Joe Allen, president of Space Industries International and a member of the Advisory Committee on the Future of the U.S. Space Program; David Black, director of the Lunar and Planetary Institute and a member of the Synthesis Group; and Glynn Lunney, vice president and general manager of Rockwell International-Houston Operations.

Reservations are due by noon July 15. Lunch is $7 for members, $8 for non-members and $6 for students. Call 333-6064, 283-4214, 283-6000 or 282-3160 to reserve a space.



JSC Photo by Andrew Patnesky

SPIN CYCLE—STS-49 Mission Specialist Pierre Thuot practices getting a grip on the spinning Intelsat-VI satellite, something he and Rick Hieb will be doing on-orbit next year. The tests also are helping develop the techniques that will be used to approach and grapple the satellite using the shuttle's robot arm before attaching a kick motor to boost it into a useful orbit. Thuot is working with the Errant Satellite Simulator, which emulates the mass properties of Intelsat with five degrees of freedom, in Bldg. 9B. The Johnson Engineering-built simulator is capable of mimicking other satellites in the future.

SOAR to feature latest advances in space flight

The latest advances and discoveries in intelligent systems, automation and robotics, human factors, life sciences and the environment will be spotlighted July 9-11 at the fifth annual Space Operations, Applications and Research Symposium and Exhibition at the Gilruth Center.

Twenty-eight sessions focusing on more than 140 papers are planned to highlight the progress and the future of the five disciplines.

SOAR is sponsored jointly by the U.S. Air Force and NASA, and is alternately hosted by the Air Force Space Command Phillips Laboratory and JSC. SOAR is the responsibility of the Space Operations Technology Subcommittee of the Space Technology Interdependency Group and is jointly chaired by Dr. Kumar Krishen of JSC and Melvin Rogers of Phillips Laboratory.

The conference will start July 9 with welcoming addresses at 8:30 a.m.; followed by overview presentations on intelligent systems at 9:30 a.m.; automation and robotics at 10 a.m.; human factors at 10:30 a.m.; life sciences at 11 a.m.; and environment at 11:30 a.m. At 3:30 p.m., Krishen will moderate a panel on technology requirements.

A dinner session is set for 6:30 p.m. July 10. Keynote speakers will be Maj. Gen. Robert Rankine, Arnold Aldrich and JSC Director Aaron Cohen.

Technical exhibits will be open July 9-10 from 8 a.m. to 7 p.m. and July 11 from 8 a.m. to noon.

Gamma Ray Observatory takes aim at first target

NASA's Gamma Ray Observatory has taken its first data from a scientific target of opportunity, the Sun.

Controllers at the Goddard Space Flight Center decided to reposition the 17-ton observatory June 7 to gather data from two X-class solar flares that occurred June 8 and 10.

The X-class is the largest and most powerful type of solar flare. Solar flares are temporary outbursts of intense solar radiation that have been observed blasting hot loops of gas more than 430,000 miles into space. These high energy outbursts have been known to disrupt the Earth's magnetic field and cause interference with communications equipment and electrical power distribution systems.

While much is known about the composition and magnitude of solar flares, surprisingly little is known about the thermonuclear processes of the dynamic solar phenomena.

The flight operations team completed the maneuver in about nine hours, a fourth of the normal time. The fast action gained 23 additional hours of observing time, allowing GRO to capture data on the first flare that otherwise would have been lost, officials said.

All four of GRO's instrument teams reported receiving good data on the solar activity, the most sensitive high-energy measurements ever of the Sun.

The repositioning of GRO demonstrates not only the flexibility of the spacecraft but the efficiency of the planned target of opportunity program, officials explained. This program, they said, allows the scientific community to position the spacecraft toward significant celestial events that cannot be predicted. In addition to solar activity, other examples of this type of event include supernova or other unplanned gamma-ray events.

Science operations for GRO, in a 287 by 280 statute mile orbit, began May 16 with the observatory pointed toward a pulsar in the Crab Nebula. Plans call for a full-sky survey expected to last 15 months. GRO was launched April 5 aboard the Space Shuttle Atlantis and deployed April 7. Its mission is to search for highly energetic gamma rays emitted by some of the most violent processes in the universe.

Atlantis crew will turn attention to medical, science experiments

(Continued from Page 1)

atory, will replace one of the existing satellites that will be parked as an on-orbit spare.

Once TDRS is deployed, the crew will turn its attention to medical and scientific experiments.

Among the medical research planned is the collection of more data on possible countermeasures to the adverse affects of space flight on the human body. Blaha and Low will run on a treadmill daily to test how well in-flight aerobic exercise expands the dimensions of the heart and increases plasma flow, combating orthostatic intolerance that can cause astronauts to feel faint upon return to Earth. Adamson will not run, serving as a control subject.

Low and Baker will participate in a repeat of the lower body negative pressure experiment which pulls fluids back into the lower body. The STS-43 experiment will test how well a combination of LBNP usage and drinking large amounts of fluids prior to reentry improves the astronauts' ability to readjust to Earth's gravity.

Scientific work will include collecting data with the Space Shuttle Backscatter Ultraviolet apparatus for use in calibrating weather satellites that continually measure ozone levels in the atmosphere.

The crew also will work with the BioServe-ITA Materials Dispersion Apparatus-2, which enables bioprocessing, cell and development tests in microgravity.

"BIMDA gives biochemists and biologists quick and easy access to space and also gives them the ability to have a multitude of samples," Lucid said.

Lucid said the crew will refly the Protein Crystal Growth experiment, this time concentrating on growing crystals in a "big batch" so that scientists may study the structure of crystals grown in microgravity.

The crew also will be working with the Space Station Advanced Heat Pipe Radiator Element-II, which Adamson said is an important technology for Space Station *Freedom.*

"Systems that we currently use on the shuttle require pumps and energy to run. (SHARE-II) is based on the fact that it can live in microgravity, and it uses such small forces as capillary action and surface tension to move a combination of fluid and gases," Adamson said. "You've got no pumps, no power applied. You just stick one end of the pipe in the hot part, where the avionics are, and the other end out in space and the process of vaporization and condensation transports the heat out and radiates it into space."

The Optical Communication through the Shuttle Window experiment will test an alternate communication link between the aft flight deck and the payload bay.

Managers will meet July 11-12 to decide on an official launch target. Launch is tentatifvely set for July 23.

Petro studying in France

(Continued from Page 1)

cooperation in space and I think that's very important to long-term cooperation on Earth as well. I think it's important for JSC to be represented in this kind of activity and it's a real honor to be in that position now."

JSC has had a student at ISU every year since its inception. Petro was chosen from nine applicants. Petro worked five years for contractor McDonnell Douglas before joining NASA five years ago. Lately, his work has concentrated on developing a new personnel launch system.

"It's going to be really beneficial to my job in systems engineering to be involved in such a multidisciplinary program. We have to bring together all the different parts of a project," he said. "This program really emphasizes that — a total systems approach.

"One of the things that I think is important to do when you get an opportunity like this that not everyone can be part of is to share it with everyone as much as you can. I'll definitely try to do a lot of that."

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.

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Congressmen visit JSC

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Space Station Projects Office Deputy Manager Carl Shelley discussed the station program and showed them through the mockups in Bldg. 9B. Space and Life Sciences Director Carolyn Huntoon briefed them on results from the recent Spacelab Life Sciences-1 mission and JSC's work with bioreactors, devices that enhance human tissue regeneration for medical research.

Flight Director Rob Kelso gave the Congressmen a tour of the Bldg. 30 Flight Control Room. Chuck Lewis, head of Space Station mission operations, and Jack Seyl, chief of the Space Station Ground Systems Division, showed them the under-construction Space Station Control Center that should be ready for partial occupancy in September.

JSC was the last stop on a tour that included Kennedy Space Center and Marshall Space Flight Center.

NASA-JSC