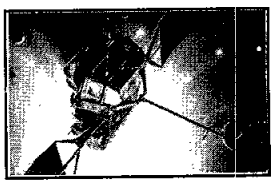
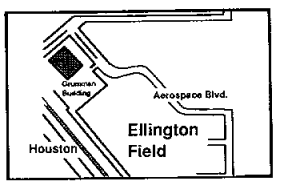
NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas



New name

Scientists are reporting remarkable discoveries by the Gamma Ray Observatory, which has a new name. Story on Page 4.



Ellington detour

Some new hangars at Ellington Field will change the way JSC folks enter the airfield. Story on Page 4.

Space News Roundup

Vol. 30 | September 27, 1991 | No. 38

SLS-1 results turning point in research

By Kari Fluegel

Spacelab Life Sciences-1 will be recorded in the annals of space flight history as a turning point and stepping stone in life sciences research.

The findings of the 18 SLS-1 experiments are already reshaping and confirming the medical community's assumptions about the human body's adaptation to space.

Last week in Washington D.C. principal investigators and their teams met to discuss preliminary results of studies performed on the seven STS-40 astronauts, 29 rats and 2,478 jellyfish.

Dr. Ron White, program scientist, said the findings generally fall into two categories: that which confirmed theories and that which were surprises. Findings confirming the hypotheses have given the space flight medicine community added confidence that researchers have achieved a certain level of understanding about what happens to the body during space flight, White said.

"Such results constitute a most important group of findings, but they are easy to dismiss as not so interesting because we expected to see what we did see," he said. "However, we should remember that things are not necessarily true, particularly in a young field, until experiments demonstrate them to be true."

Unexpected results, however, tend to capture many people's interest.

"They force us to reassess all of our ideas about how the system in question is functioning," White said. "Obviously it's not how we thought. Of course any revision of how the biology works in space translates back to how the biology works on the ground."

Dr. Arnold Nicogossian, director of NASA's Life Sciences Division, said the investigations in general demonstrated that the onset of adaptation in weightlessness occurs earlier than expected and affects all body systems.

In addition, the nervous system and the endocrine system play a crucial and important role in regulation of these adaptive changes, he said.

"The biological studies that we did made it possible today for us to separate pure effects of microgravity from the normal age-related changes," he said. "This is very important when one has to look at long duration missions like a Mars mission."

Please see **FIRST**, Page 3

Long distance dialing change taking effect

Implementation of the new FTS2000 Federal Telecommunications System will cause several changes in the next few months in the way JSC uses long distance.

The changes are caused by the continuing step-by-step implementation of the FTS2000 services per GSA instructions, said Don White of the Information Systems Directorate.

On Nov. 18, the current FTS seven-digit dialing will be eliminated. Calls to other government offices after that date will require the full 10-digit commercial number.

For example, calls to NASA Headquarters that now can be dialed as 87-453-XXXX will soon require 87-202-453-XXXX to complete the call.

The change will affect all onsite and offsite buildings.

The current AT&T calling cards will be invalid after Monday. Taking their place will be new FTS2000 authorization codes issued to personnel requiring long distance direct dialing from non-government phones.

JSC directors have been asked to provide a list of individuals needing the FTS2000 cards and international service cards to the Information Systems Directorate as soon as possible.

JSC Photo by Benny Benavides

DEEP TROUBLE—Public Affairs Specialists James Hartsfield, right, and Kyle Herring check out the 6-foot-deep hole in their Bldg. 2 office. Center Operations workers jack-hammered through the concrete floor and dug the hole to reach a potable water pipe that broke over the weekend, flooding the building with about two inches of water. Employees of the Public Services Branch and the Media Services Branch were affected by the flooding, which soaked some stored materials and immersed telephone and electrical wiring. Repairs are expected to take about two weeks.

Atlantis work on track for October mate

By James Hartsfield

Work is going smoothly to prepare *Atlantis* for a launch in middle-to-late November on STS-44, preceded by a move of the spacecraft to the Vehicle Assembly Bldg. for mating with the other shuttle components in mid-October.

This week, Kennedy Space Center technicians finished re-installing the chin panel, a piece of reinforced carbon-carbon heat protection tiling between the orbiter's nose cap and nose landing gear. The panel had been removed for a routine inspection and repair of several slight cracks by the manufacturer.

During a routine inspection, cracks also were found in T-seals that are attached to the fuselage underneath the thermal protection panels on the leading edges of *Atlantis*' wings. The seals, made of reinforced carbon-carbon, allow the thermal protection on the front of the wing to expand and contract with different temperatures. Managers have decided to remove all of the seals and analyze any effects the cracks may have, however no delay in the launch preparations has been indicated so far.

Work also began to replace a leaking steering jet on the left orbital maneuvering system pod and heat shields were installed around *Atlantis*' three main engines.

In the VAB, the external fuel tank and solid rockets for *Atlantis* were to be mated together this week to await the spacecraft.

Meanwhile, *Discovery* began its trip back to KSC following the landing of STS-48 at Edwards Air Force Base, Calif. *Discovery* left Edwards atop the Shuttle Carrier Aircraft on Tuesday. It stopped at Tinker Air Force Base in Oklahoma City overnight due to bad weather and arrived safely at KSC on Thursday..

Discovery will occupy Orbiter Processing Facility 3, the newest processing hangar. *Discovery*'s next mission will be STS-42, carrying the International Microgravity Lab-1, in January 1992.

Endeavour is in Bay 1 of the processing hangar being readied for STS-49 in April 1992.

Source Evaluation Board members earn honors

Several JSC employees this week received special awards in recognition of their outstanding performance as members of Source Evaluation Boards for major JSC procurements. A total of $33,400 was distributed among the SEB participants.

Procurement Director Gene Easley presented SEB participants with the awards, which were made in conjunction with a special NASA Headquarters award allocation.

The awards were designed to focus attention on the importance of the SEB process by rewarding participants. SEB participants are selected from throughout the center. They prepare the request for proposal, evaluate contractor proposals, and present SEB findings to the source selection official for contractor selection.

"As a result of the NASA HQ initiative to streamline the acquisition process, the strong support and commitment of JSC Director Aaron Cohen and all of our JSC top management, and, most importantly, the conscientious dedication of our SEB participants, we have been able to significantly reduce the amount of time it takes to complete an SEB," Easley said. "It is important to note that this acceleration in our source selection process has been accomplished without a compromise in the quality of the work performed by these SEBs.

"Individually and collectively, each of these employees made a significant contribution to our acquisition process," Easley said.

Please see **AWARDS**, Page 4

Building a better expert system

Conference shares applications for CLIPS tool

By Kelly Humphries

Users of expert systems from across the country gathered at the Gilruth Center this week to discuss CLIPS, the JSC-developed tool that has become one of NASA's most versatile software exports to the computer world.

More than 100 people attended the second annual CLIPS Users Group Conference Monday through Wednesday, learning about the various applications for the tool that allows users of almost any computer to develop their own expert systems.

Expert systems are computer programs that emulate human expertise, using a set of rules or objects to help their users make decisions rather than just performing tasks step-by-step.

Bob Savely, Software Technology Branch chief and the leader of the development team, said CLIPS (C Language Integrated Production System) has been instrumental in developing expert systems that are used everywhere from the space program to farming and forestry.

"CLIPS has enabled the use of expert systems technology on many frontiers," Savely said. "We wanted something that could run on all kinds of computers, from a PC to a Cray."

Gary Riley, another member of the CLIPS development team, explained that expert systems are designed to capture knowledge.

"A lot of computer programs are built around what you might call algorithmic procedures, or defining a set of steps you do to accomplish some task," Riley said. "If you were to go to a doctor and the doctor was trying to diagnose what was wrong with you, he wouldn't necessarily follow step-by-step procedures. He has a set of rules he uses. He doesn't go through every item on a list of diseases to figure out what you've got. He says 'You've got spots on your face and you're running a temperature, so you have measles.'"

Please see **CLIPS**, Page 4

JSC Photo by Robert Markowitz

CLIPS experts Brian Donnell, Beby Ly and Gary Riley, behind the table, from left, talk to users during this week's Gilruth Center conference.

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; adult, $17.25; (2-day) child $15.95; adult, $21.95.

Six Flags (valid until Nov. 17): adult (1 day) $13.95.

Texas Renaissance Festival (9 a.m.-6 p.m. weekends Oct. 5-Nov. 17, Plantersville, Texas): child (5-12), $5.55; adult, $9.25.

Renaissance Festival bus trip (7:30 a.m.-5:30 p.m. Oct. 26 or Nov. 9, includes transportation and admission): child, under 5, $7; child, 5-12 years, $10; adult, $15.

NASA Night at Delta Downs (Nov. 16-17, tickets go on sale Oct. 2). Day trip (3:30 p.m.-2:30 a.m., includes transportation and admission to clubhouse): $15. Overnight trip (12:30 p.m.-12:30 p.m., includes transportation, reception at Beaumont Hilton, accommodations, admission, brunch): $50.

JSC

Gilruth Center News

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

Defensive driving — Course is offered from 8 a.m.-5 p.m., Nov. 16 or Dec. 14. Cost is $15.

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

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

Weight safety — Required course for employees wishing to use the Gilruth weight room. The next classes will be from 8-9:30 p.m. Oct. 3 and Oct. 17. Cost is $5; preregistration required.

Ballroom dancing — Professional instruction in beginning, intermediate and advanced dance. Eight-week session meets Thursdays beginning Oct. 3. Cost is $60 per couple.

Aikido — Martial arts class meets from 6:30-7:30 p.m. Tuesdays and 5:15-6:15 p.m. Fridays. Next month-long class starts Oct. 1. Cost is $35.

Intercenter run — Runners may turn in two-mile and 10-kilometer run times for competition among NASA centers throughout October. Participants must register at the Gilruth.

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

Fiction workshop — Writing workshop meets from 6:30-9 p.m. Wednesday's for five weeks beginning Oct. 2. Cost is $80.

JSC

Dates & Data

Today

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

Monday

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

Tuesday

Space operations seminar — Real-time UNIX Operation Systems will be discussed at an Oct. 1 session of Space Operations Seminars sponsored by JSC, the University of Houston-Clear Lake and the Flight Design/Dynamics Working Council. Registration begins at 7:30 a.m. in the UHCL Bayou Bldg., Rm. 2-311. NASA employees should call Jane Kremer, x32601 to preregister. For more information, call the Software Engineering Professional Education Center, 282-2223.

Free enterprise lecture — A brown-bag luncheon will discuss "Inflation and Depressions" at 11:30 a.m. Oct. 1 in the Lockheed Plaza eighth floor Training Rm. Call Charles Campbell at 333-6107 for more information.

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

Wednesday

Astronomy seminar — The JSC Astronomy Seminar will meet at noon Oct. 2 in Bldg. 31, Rm. 129. Dr. Nadine Barlow will report on the Mars Surface and Atmosphere Through Time Workshop. For more information, call Al Jackson, 333-7679.

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

Thursday

Cafeteria menu — Special: stuffed cabbage. Entrees: beef tacos, ham and lima beans. Soup: beef and barley. Vegetables: ranch beans, Brussels sprouts, cream style corn.

Oct. 4

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

Oct. 8

Space operations seminar — On-orbit and Launch Window Design will be discussed at an Oct. 8 session of Space Operations Seminars sponsored by JSC, the University of Houston-Clear Lake and the Flight Design/Dynamics Working Council. Registration begins at 7:30 a.m. in the UHCL Bayou Bldg., Rm. 2-311. NASA employees should call Jane Kremer, x32601 to preregister. For more information, call the Software Engineering Professional Education Center, 282-2223.

Free enterprise lecture — A brown-bag luncheon will discuss "The Correlation of Economic Freedom and Living Conditions" at 11:30 a.m. Oct. 8 in the Lockheed Plaza eighth floor Training Rm. Call Charles Campbell at 333-6107 for more information.

Oct. 9

Astronomy seminar — The JSC Astronomy Seminar will meet at noon Oct. 9 in Bldg. 31, Rm. 129. Dr. Greg Ojakangas will report on the Near Earth Asteroids meeting. For more information, call Al Jackson, 333-7679.

Oct. 10

NCMA conference — The Space City-Houston Chapter of the National Contract Management Association will host a fall regional conference, "Acquisition: The Next Generation," from 7:30 a.m.-4:30 p.m. Oct. 10-11 at the South Shore Harbour Resort and Conference Center. NCMA President Sandra O'Connor will speak. Call Jeff Cullen, x31880, or Cindy Moore, x37589, for more information.

SSQ meets — The Society for Software Quality Houston Chapter will hold a charter dinner meeting at 5:30 p.m. Oct. 10 in Bayou Bldg. Rm. 1-427 at the University of Houston-Clear Lake. ISD Deputy Director Jack Garman, Mitre Corp.'s Jack Heberlig, IBM's Tony Macina, Unisys Corp.'s Jack Munson and BMC Corp.'s Ted Van Duyn will discuss the "Next Steps for Software Quality — An Executive Perspective." Panel discussion tickets are $5. Dinner tickets are $10 in advance, $15 at the door. Call Nancy Falk, x32381 for reservations and information.

Swap Shop

Property

Rent: Galveston west end, 2-1.5, sleeps 9, off season rates; Sale: Galveston lot w/waterfront view, 60' x 120'. 286-8558.

Rent: Lake Travis cabin, priv boat dock, CA/H, fully equipped, accom 8, wkly/daily, $325/$80. 474-4922.

Sale/Lease Heritage Park, 3-2-2, no pets, $70K/$700/mo plus dep. x35021 or 486-6084.

Sale/Lease: Friendswood/Wedgewood, 3-2-2, lg gameroom, $65K/$750/mo plus dep. 333-7010.

Lease: El Lago condo, 2-1, balcony w/lake view, $550/mo incl util, avail Oct 1. 282-6573 or 532-1388.

Sale: Friendswood lot, 0.8 acre, all util, $50K. Ron, 996-9724.

Lease: Baywind II corner unit, 2-2.5, 2 story, W/D, refrig w/ice maker, FPL, ceiling fan in master, $575 plus $250 dep. Sue, 282-3950 or 480-8996.

Sale/Lease: Waterfront, townhouse, 3-2-2CP, util rm, 2 FPL's, formals, wet bar, boat slip in shed w/lift, storage locker, assume 8.7 percent, $89.9K/$1.4K, all bills pd; The Landing, waterfront, 2-2, 1300 sq ft, boat slip w/lift under shed, lg carports, lg storage locker, assume $69.9K, or refinance, will carry 2nd, $825, all bills pd. 280-5801 or 326-2221.

Rent: Clear Lake, 4-2-2, all appli, deck, spa, gas FPL, $895 plus dep. 280-9780.

Sale: Pasadena, Parkgate, 3-2.5-2A, pool, FPL, fans, new roof, carpet, dishwasher. x30909 or 487-4249.

Lease: Pipers Meadow, 3-2-2, W/D conn, ceiling fans, blinds, avail Nov 1, $850. x31826 or 480-9436.

Cars & Trucks

'88 Chevy Beretta GT, 45K mi, warr, $6.5K OBO. Steve, 333-7371.

'84 Corvette, gold, $11.5K OBO. Laura, x34320.

'87 Mustang convertible, 2.3L, 5 spd, graphic equalizer, tilt, cruise, new GT alloy wheels, low mi, $7.5K OBO. 283-5482 or 333-4337.

'89 Cutlass Sierra, 4 dr, 6 cyl, pwr access, cass, blk w/gray int, $8.5K. 497-6401.

'81 diesel Rabbit, 5 spd, A/C, 150K mi, runs, needs some work, $700. 992-5740.

'72 MGB, ex cond, $4.5K. 532-2188.

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

'85 Ford Bronco II, 4x4, 5 spd, P/S, P/B, A/C, AM/FM, sunroof, tow hitch, good cond, $5950. 532-1673.

'86 Mazda RX-7, 52K mi, sports pkg, A/C, AM/FM/cass, $6595. Phil, 488-4453.

'73 Mercedes 450SL, low mi, both tops, ex cond, $11,750. 282-5325 or 488-8493.

'75 Chevy Impala station wagon, runs good, new tires, batt, alternator, muffler, $1275. Tom, 474-2041.

'86 Honda Prelude SI, 5 spd, wht/blk, low mi, ex cond, $7.8K. Wayne, x36617 or 488-9884.

'89 Mustang GT, red, 5 spd, 5.0L, loaded, ex cond, 39K mi, $9.8K. 488-4373.

'85 Chevy Cavalier, 2 dr, auto, P/S, P/B, digital inst panel, sun roof, AM/FM/cass, blk/silver, ex cond, $3.5K OBO. 532-3348.

'90 Acura Integra, 4 dr, auto, cruise, tilt, $12,575. 331-2721.

'74 MGB-GT hardtop, A/C, wire wheels, new Michelin radials, Weber carb, recent valve job and bottom end, $1950 OBO. Wayne, 339-2158.

'86 Pontiac Firebird, 47K mi, red, ex cond, $5.5K. x33568 or 277-4178.

'82 Chevette, 4 dr, auto, 65K mi approx, A/C broken, $850. 280-9479.

'89 Honda Prelude Si, 5 spd, sky blue, 28K mi, ex cond, security sys, alum wheels, loaded, $12K. 283-4258 or 480-9125.

'82 Honda Accord, needs brake repair, otherwise parts car, $800 OBO. Ron, 996-9724.

Cycles

Miyata 210, 10 sp bike, Sun Tour components, $200 OBO. Steve, 333-7371.

'80 Yamaha 1100 XS, over $300 in repairs, $1.1K or trade for car/truck/riding mower and cash. 339-1337.

KHS Montana Crest mountain bike, purple, 18" frame sz, 24" x 1.9" tire sz, knobbys, 21 spd w/Shimano Exage Trail front triple crank set, derailleurs, shifters, $150. 282-3903 or 538-1794.

'85 Yamaha RZ 350, red/wht/blue Kenny Roberts replica, 5K mi, $1.2K OBO. Jim, 585-0679.

'86 Harley Davidson Electra Glide, 6.6K mi, $6.8K. (409) 744-5205.

Boats & Planes

15 ft Jon boat, beat up, no leaks, $100. 339-1337.

20hp Mercury O/B motor, $500; 8 ft inflatable dinghy w/floor boards, 2.5hp Evinrude O/B motor, $500. John, x35561.

Surfboard, 8'8" postmodern noserider, trifin w/deck pads, ex cond, $250. 554-2320.

Lido-14 sailboat, sails, trlr, $995. R. Hoover, x31360 or 996-7716.

17' Glastron fiberglass, '85 Mercury O/B, 75hp w/pwr trim, trlr, Bimini top, stereo, cover, seats 8, ex cond, $3.4. 333-7180 or 333-9581.

'89 Four Winns, 180 Horizon Runabout, 175 I/O, Brougham seating, low hrs, $13.9K. Terry, x39234 or 338-1443.

Audiovisual & Computers

Apple II C, mono moni, ext 5.25" dr, mouse, SW, 40 blank disks, $275; Pioneer turntable, $40 OBO; Technics turntable, ex cond, $80. Anne, x34493 or 286-2932.

PC-XT clone, turbo, 640K Ram, 40 MB HD, 2 FD drives, monochrome moni, $450. David, x38179.

Atari 1040 ST computer w/SC1224 color moni, mouse, joystick, 3.5" 720K DD, 5 1/4" 360K DD for IBM compatibility, $400 OBO. Jody, 282-3155.

HP41-CX calculator, carrying case, rechargeable batt and charger, electronic card reader and cards for saving memory, optical wand for reading barcode programs into memory, advantage math solutions pkg $150 OBO; Turbo GrafX-16 video sys w/4 games, extra controller, $150; children's "Video Smarts" learning center w/3 VHS cass, $40. x35896 or 488-7982.

IBM PS/2 mod 25, 286/20 MB, monochrome moni, enhanced IBM keyboard, Microsoft mouse, IBM graphics printer, DOS 3.3, DW4, Lotus, Harvard Graphics, Quicken, $950. Starry, 656-4611 or 286-1064.

Commodore SX-64 PC, color CRT, modem, 3.5" DD, joysticks, software, $250. x35180 or 326-3706.

PC XT clone, moni, FD, 640K RAM, parallel port, game port, $300. Don, 335-2539 or 992-2827.

IBM portable PC, 640K, 2 FD, $200 OBO. Molly, 282-4248.

Panasonic KX-P1524 printer, wide carriage, 24 pin, Epson compatible, low mileage, ex cond, $400. Allen, 996-0501.

Kenwood HF transceiver TS-140S, 500 KHZ-30MHZ, power supply, Astron-RS-20M. Jim, x35852 or 474-7747.

NEC Powermate PC 5x20/44MB HD, VGA moni, 256K VGA card, new, $1.9K. 488-4373.

Zenith 286 laptop computer, 1 MB RAM, 40 MB HD, 2400 Bd modem, 3 1/2" floppy, batt pack, carrying case, $1.2 OBO. 941-2689.

40 MB Sony internal HD from Mac II CX, good cond, $100. Dan, 333-6158.

Musical Instruments

Handmade guitar, Telecaster copy w/stand, practice amp, Rockman amp, strap, all cables, $500. x30822 or 332-6776.

Pearl 5-piece blk drum set w/hardware, no cymbals, export series, $500 OBO. Rommel, 282-5544.

Pets & Livestock

Free female retriever mix, sable/wht, shots, spayed, obedience trng. 363-9061.

Free wht kitten. 283-4087.

Registered male persian kitten, $150; female persian kitten, blue-cream, $350. 997-9430.

AKC laborador puppies, $175. x31385 or 947-2025.

Baby cockatiels. Linda, 484-7834.

2 free spayed female cats, all shots. 486-4701.

AKC bassett hound puppies, males/females, wormed, $175/ea. Gary or Betty, 332-5198.

Purebred female doberman puppy, blk/red, shots, $150 OBO. Diana, 282-4101 or 992-2443.

Rabbits, $7 and up. Gailo, 554-6200.

AKC female pomeranian puppy, orange w/blk face, shots, papers, 12 wks, $250. Wendi, 286-4226.

Household

King sz motion waterbed mattress, $20. Larry, x30428.

22 cu ft GE refrig, wht w/wood trim, new icemaker, crushed/cubed ice dispenser, adj glass shelves, frost free, energy saver, ex cond, $400. Billie, x33864 or 488-5543.

2 club chairs w/plump pillow back, celery grn velvet, 30W x 32D x 30H, $150/ea or $275 for both. 282-3788 or 480-2188.

8 pc sec sofa or pit group, $200; rattan pappasan chair w/cushion, $60; rattan hanging chair w/cushion, steel frame, $125, both chairs for $150 or all items for $300. Chuck Wheelock, 283-5600 or 538-3273.

Waterbed, $150; 16 ft Hobie w/galv trl, $800, '83 VW GTI, $2.5K; Puch moped, $125. Andy, x32503 or 334-2647.

Solid oak tbl, 4 chairs, leaf, ex cond, $650; cherry 4-poster king sz bed, $400. 554-7012.

Contemporary loveseat, ex cond, $150. x34255 or 286-1914.

Queen sz waterbed, simple wood hdbd, semi-waveless matt, heater, liner, $100. Sean, 282-2825 or 992-1821.

Contemporary LR suite, sofa/loveseat, plush beige w/flamestitch design, oak trim; recliner, brn w/blue, ex cond, $350. x34722 or 996-1105.

Etagere, $80; antique dining tbl w/chairs, $75; 2 end tbls, $15/ea; 2 lamps, $10/ea; dresser w/mirror, $40. Rob, x31477.

Sony 19" color TV, $75; microwave, $75; student desk, $40; VW cover, $20; swivel rocker, $15; teak entertainment ctr, $150. 280-9780.

Queen sz waterbed, semi-motionless, matt pad, sheets, new heater, $85. Howie, 282-3841 or 482-8354.

Sofa w/hide-a-bed, brn/wht, ex cond, $50. x31497 or 554-4215.

Twin bed w/sofa, cover, bolsters, $50 OBO. Karen, x34705 or 488-0056.

LR set, sm couch, 2 chairs, 2 lg end tbls, $300; lg sect couch; $200, coffee tbl, $75. 944-5589.

Photographic

Olympus auto-zoom lens 35-105 mm, f-stop 3.5 to 4.5, $250; Vivitar zoom Thyristor flash 3500, new, $80. 282-2894 or 486-2048.

Wanted

Want scuba gear for small lady, suit, BC, regulator, flippers, must be relatively new and reasonably priced; underwater camera, 100ft or greater, reasonably priced. 280-8796.

Want home for 2 1/2 yr old blk lab. Kirk, 282-2911 or 332-5876.

Want 5-20 gal glass carboys for wine making. Kelly, 282-2586.

Want rm for rent, 3 nights per wk, nonsmoker, $180 per mo, incl util OBO. Doug, x35214 or 444-3164.

Want female housemate to share 3-2-2 house in The Landing, private 2 rms, bath, $350 mo plus 1/2 util. 332-1420 or 554-4944.

Want bassist & drummer to jam with. Steve, x32513 or 532-2126.

Want roommate(s) for 4-2.5-2, 2 story house in Seabrook, fully furn or unfurn, 2 phone lines, fenced, $400/mo plus some util. 474-4742.

Want female, non-smoking roommate to share 3-2-2 house in Clear Lake, after Nov 1. Diana, x31512.

Want ice mach, riding lawnmower. Bill, x39230.

Want heavy duty drill press, air compressor. x38039 or 333-1751.

Want 75 gal tank and stand for saltwater. 992-3876.

Want riders to carpool from SW Alief and Braeswood, 610 locations to CL/JSC. Satish, 282-4483.

Miscellaneous

Schwinn Mountain bike, 18 spd, ex cond, $125; 7' couch w/chair and footstool, $75 for all. 941-2689.

Rattan bar, glass top, 4 chairs, $350; 8 x 12 oriental rug, maroon/wht, $80; 15 ft bass boat, 50hp Johnson, 2 chairs, depthfinder, trlr, $15K. 471-5428.

14 K ladies Rolex, oyster w/oyster band, ex cond, $4500. 326-3278.

Interior 6-panel doors, wht, no hardware, ex cond, one 32" wide RH, $40, one 24" wide RH, one 24" wide LH, $35/ea. Anne, x34493 or 286-2932.

4 ch R/C airplane, Super Chipmonk, $350. Larry, x30428.

3 spd Corvair transmission. Trey, 280-4275 or 484-7834.

Wedding gown, wht, sz 5/6, $150; 21 ft round swim pool, almost 2 yrs old, all access incl, $700 OBO. 471-3165.

2 Pres & First Lady Gold Charter memberships, $850/ea OBO, monthly dues $5.30 for life. Debi, 422-4781.

2 tires, P185/75 SR14, some tread left, $5/ea. 283-4087.

Craftsman production shaper, 28 HSS, 8 carbide cutters, mitre gauge w/holddown, castors, was $1250, now $600; Craftsman bench-top router/shaper w/hold down, accepts 1/4 in router blades, and 1/2 in cutters, was $200, now $100; Craftsman 6" Jointer, spare blades, set gauge, castors, was $400, now $200; woodworking vise, $20. Chuck Wheelock, 283-5600 or 538-3273.

21" Guardian pwr dr mower, hard to start, needs work, side bag; tubeless steel & poly plies, 165SR13 tire worn, good spare, Bridgestone steel belt radial, 155SR13 tire worn. 333-2778.

Sabino crystal collection, 6 beautiful med to lg pieces, BO. Bob, x33149 or 488-7036.

Unique collection of 63 mini liquor bottles, incl 27 types of Scotch, $120 OBO. John, 462-1402.

PU bed matt, Ford full size short-bed, blk, ex cond, $35. 335-2115 or 532-1175.

Trvl trlr towing pkg, for full sz Ford van or truck, incl tow veh receiver, trlr weight, 10K lb class, dist hitch w/sway control, was $650, now $275. Tom, 474-2041.

Wedding dress, sz 10, long sleeves, beaded bodice, 8 ft train, was $850, now $450 OBO. 338-2829.

Gerry baby monitor, $20; Today's Kids outdoor swing, $10; Fisher Price potty, $15; Fisher Price car seat, $20. 487-1883.

Diamond anniversary band, 2.10 cts, two rows of 5 diamonds, VVS1 in clarity, E-F in color, ex cond, BO over $3.1K by Oct 20. 282-6701 x3478.

Winchester mod 1300 shotgun, 12 ga, Winchoke, $180; Ruger blackpowder revolver, .44 cal, SS, $250. Gary, x31361 or 332-6325.

Lawn Boy mower, not running, $40; 12 baseball card factory sets, $30/ea; mini bottled water plant, $150; Everex 80286 mach, $1K. Tony, 335-4299 or 482-4156.

Computerized Pro-Folm stairclimber, ex cond, convertible to x/c ski mode, $125. Curt, 480-9034.

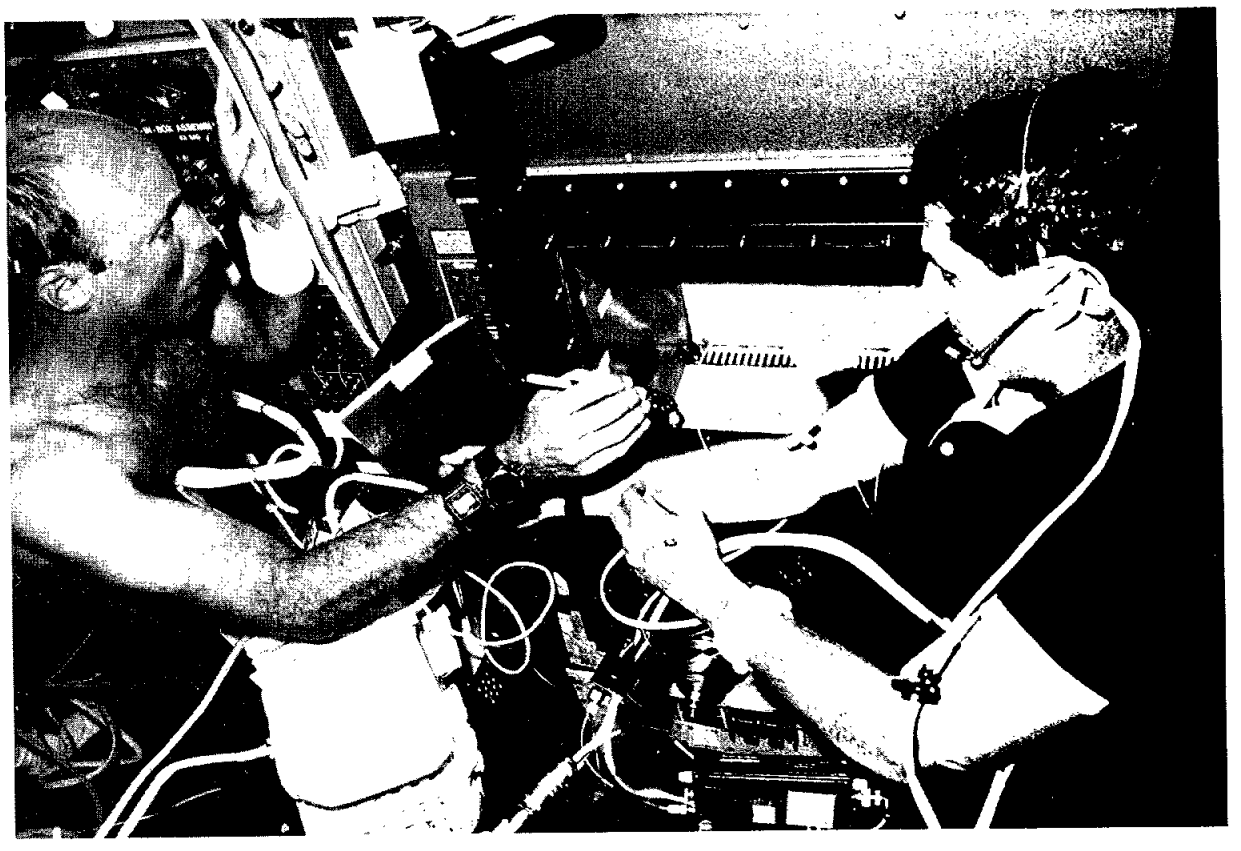
Tektronics oscilloscope, 5100 series, needs horizontal sweep module, have parts and plans to build one, $20; Hickcock vacuum tube tester, cards to setup configuration automatically, good cond, $20; Sharpe copy machine, works but needs drum cleaned, $25. Howie, 282-3841 or 482-8354.

Coleman Holiday camping tent, canvas, ex cond, $50. Joe, 944-4581.

New 60 x 32 garden window, $95; wood trim, BO. x38039 or 333-1751.

First Findings

SLS-1 preliminary results form foundation for future life sciences research



NASA Photo

Mission Specialist Jim Bagian, left, removes the catheter from Payload Specialist Drew Gaffney's arm. Gaffney worn the catheter through the first flight day to monitor his central venous pressure.

(Continued from Page 1)

Nicogossian said the postflight recovery times, at least for short duration missions, are probably dependent on the length of exposure to the microgravity environment. However, the postflight microgravity induced changes are reversible thus far.

The SLS-1 experiments also helped investigators determine that ground-based models used to simulate the effects of microgravity need some refining.

For the practice of space flight medicine, Nicogossian said, four lessons were learned as a result of the nine-day flight.

First, researchers now have a better understanding of the health parameters that should be monitored during and after the flight, he said.

The investigations also helped determine it is unlikely that the shifting of body fluids to the upper body that occurs in microgravity will result in "pulmonary edema" or the swelling of lung tissue caused by fluids in healthy individuals as suggested by some scientists.

Also, some of the countermeasures used to prepare a human for the return to Earth should be applied early in flight and that the first week after the return is critical for inducing the readaptation process, he said.

The final reports of the SLS-1 investigators will not be ready until mid-1992. Until that time, research teams are continuing to analyze the data.

"Listening to the investigators present their findings, it was clear that the excitement of the scientific quest was back in their voices," White said. "They were no longer speaking hopefully about a future study in space after waiting 13 years, they were speaking of the future in confident tones.

"This is an incredibly rich data set that is only a preview of what's to come."

Five SLS-1 experiments focused on metabolic systems.

"I would like to report right now that the flight experiment was a complete success in the collection of all our measurements," said Dr. Carolyn Leach Huntoon, director of JSC's Space and Life Sciences Directorate and principal investigator for "Fluid-Electrolyte Regulation During Space Flight."

"This flight for the first time we were able to make some key measurements very early in flight."

Other metabolic investigators and their experiments include Dr. Clarence P. Alfrey of the Baylor College of Medicine, "Influence of Space Flight on Erythrokinetics in Man" and "Regulation of Blood Volume During Space Flight," and Dr. Robert D. Lange of the University of Tennessee, "Regulation of Erythropoiesis During Space Flight."

Experiment protocols for the blood and fluid regulation investigations require astronauts to collect blood and urine samples, inject tracers and record food intake and body mass.

As a side observation, investigators noted that astronauts saw weight changes early in the flight and had a 70 percent reduction in fluid and calorie intake on the first day of flight.

"This initial exposure to weightlessness is a significant change in the body so that adaptive processes are set into place," she said. "Those numbers are real and very significant in the early measurements."

Tracer injections revealed that the body begins to adapt sooner than previously expected.

"Some of these adaptive processes that we had assumed took several days to occur, we now understand that they are occurring within hours of weightlessness," Huntoon said.

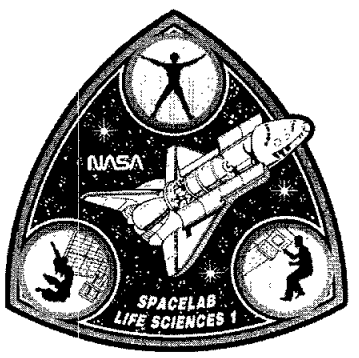
Metabolic investigators also were able to determine that the way the kidney handles the blood brought to it to cleanse is changed during space flight.

"We had an increase in the filtration rate and a decrease in the plasma flow," she said. "The exact implications of these changes as far as physiology of space flight we will to have to work on understanding."

Dr. Augusto Cogoli of the Swiss Federal Institute of Technology conducted the "Lymphocyte Proliferation in Weightlessness" experiment that confirmed the suppression of lymphocyte activation during space flight.

The in vitro lymphocyte study also found that by using microcarriers — small glass beads that promote cell interaction — the suppression was reduced.The four cardiovascular/cardiopulmonary investigations also resulted in several important findings. In the past, cardiopulmonary researchers assumed that gravity and gravity's distortion of the lung played a large role in its function, even to the extent of disease formation. In theory, without gravity, the lung would function differently.

"Pulmonary Function During Weightlessness" lead by Dr. John B. West of the University of California-San Diego, however, discovered that there are no significant differences in the function of the lung in space.



'Listening to the investigators present their findings, it was clear that the excitement of the scientific quest was back in their voices.'

— Dr. Ron White, program scientist.

"That really forces Dr. West and his colleagues to reexamine normal pulmonary function on the ground," Dr. C. Gunnar Blomqvist of the University of Texas Southwestern Medical Center said, reporting for the cardiovascular/cardiopulmonary teams.

The SLS-1 science complement also carried an experiment that studied the carotid baroreflex, the body's sensors that monitor blood pressure in the neck and regulates it by speeding or slowing the heart.

In "Influence of Weightlessness Upon Cardiovascular Controls," Dr. Dwain Eckberg of the Medicine College of Virginia found he could examine that reflex by changing pressure in the area surrounding the neck creating a vacuum or counterpressure. The study, which was the first measurement of the baroreflex in microgravity, confirmed the theory that the baroreflex is less efficient in space and on recovery than it is normally.

Blomqvist was principal investigator of the study "Cardiovascular Adaptation to Zero-Gravity."

His team found that in space the blood vessels seem to have a decreased ability to contract and increase resistance thereby increasing blood pressure, he said.

The Blomqvist team also measured for the first time central venous pressure which serves as an indicator of cardiac pump priming pressure. Payload Specialist Drew Gaffney, who is a member of the Blomqvist team, had a catheter which reached above the heart inserted in his arm for launch and the first day in space.

"This gave us an opportunity to study the dynamics of the fluid shift that we know occurs in space, and what we found was that the changes occur much more rapidly than expected," Blomqvist said.

"We thought that cardiac filling — cardiac pressure — was increased during the first day in space but found that actually a great deal of adaptation to space seems to occur on the launch pad and during the launch when pressure goes up. And pressures seem to go back to normal levels immediately upon entry into microgravity.

"That's a very surprising finding that needs further confirmation, but that fits with some of Dr. Huntoon's measurements on blood volume."

Dr. Leon Farhi of the State University of New York examined oxygen transport and cardiac output in space and on return to Earth in "Inflight Study of Cardiovascular Deconditioning. "Farhi and his team found that early after return, cardiac function with the astronauts lying down was essentially normal. However, in the upright position there is a decreased capacity in the cardiovascular system, Blomqvist said.

Blomqvist and Farhi also collaborated on a study of maximal exercise capacity within hours of return.

"We found that cardiac pump capacity was decreased at that time by about 25 percent," Blomqvist said. "There was a quick recovery. When we reexamined in about one to two days the astronauts were back to 90 percent of their baseline measurements and after a week they were back to within 95 percent of baseline."

The data suggests, Blomqvist said, that the major problem is with the cardiac priming pressure.

"It's a matter of fluid metabolism rather than anything being wrong with the heart muscle itself or the regulatory mechanisms," he said.

Dr. Emily Morey-Holton of Ames Research Center and prinicpal investigator of "Bone, Calcium and Space Flight" said that overall, the flight animals, regardless of whether they were housed individually or in a group, gained the same amount of weight as the ground control animals.

Preliminary findings include reports from Dr. Danny Riley of the Medical College of Wisconsin and Dr. Kenneth Baldwin of the University of California that the anticipated decrease in muscle mass did occur, Morey-Holton said.

Riley is principal investigator of "Electron Microscopy, Electronmyography and Protease Activities of Rat Hind Limb Muscles" and Baldwin is principal investigator of "Effect of Zero-gravity Exposure on Biochemical and Metabolic Properties of Skeletal Muscles."

Morey-Holton added that Baldwin also reported that there was a change in the way the muscle uses energy and suggested the decrease in muscle mass coupled with the altered energy metabolism could impair the ability of humans to function and perform normally on return to a gravity environment.

"He also noted that postflight the animals appeared to recover but that the recovery in mass and energy utilization was not completed within the time equal to the space flight period," Morey-Holton said. "So it took longer for the defect to recover than the time the animals were in flight."

Morey-Holton said her bone study focusing on the rats' long bones changed slightly due to an unexpected report from the individuals processing the rodents. The skull cap of the flight animals was harder to process than that of the ground control group.

"We decided that indeed we need to look and see if bone formation increases in the head contrary to its decrease in the long bones or the limbs," she said.

Investigations of the neurovestibular system used humans, rodents and jellyfish as subjects during SLS-1.

Dr. Lawrence Young of the Massachusetts Institute of Technology, principal investigator of "Vestibular Experiments in Spacelab" said his research focused on the otoliths, the inner ear stones which send cues about vertical orientation to the brain.

"The otoliths, which are tiny bit players here on the ground, take on leading roles when in space," Young said. "The vertical looses all meaning when in orbit but the otoliths continue to send orientation signals to the brain. ... They no longer point to down but to the direction opposite of linear acceleration."

The consequences of the changed role of the otoliths include space motion sickness.

The human study focused on whether behavior and posture adaptation to microgravity and readaptation to Earth's gravity while the rat study looked at anatomical changes in the mature mammalian otolith organ and the jellyfish experiment studied the influence of gravity on developing gravity receptors.

Regarding "Effects of Microgravity-Induced Weightlessness on Aurelila Ephyra Differentiation and Statolith Synthesis" led by Dr. Dorothy Spangenberg of the Eastern Virginia Medicine School, Young said the statoliths of the flight jellyfish, which are similar to human otoliths, appear to be normal in number and shape. The swimming or "pulsing" of the jellyfish also seemed to be normal in flight, however, detailed studies are continuing to determine if differences exist.

The significant findings of the rat neurovestibular investigation called "A Study of the Effects of Space Travel on Mammalian Gravity Receptors" by Dr. Muriel Ross of NASA's Ames Research Center was that the mammalian gravity receptors are "beautifully organized" to adapt to an altered gravitational environment, according to the investigator's report.

Though the human experiments, which were reserve activities for STS-40, will provide data points for the continuing investigations of space motion sickness and readaption to Earth's gravity, they also complement the basic developmental biology on the jellyfish and the anatomical evidence found in the rodent experiment, Young said.

Gamma ray observations shake popular theories

NASA's survey of the high-energy universe is "rewriting the book on gamma ray astronomy," and its first major discovery appears to have devastated the most widely held theory on gamma-ray bursts.

The first release of results from the observatory, launched in April from the Space Shuttle *Atlantis*, was accompanied by the announcement that the satellite has been renamed the Arthur Holly Compton Gamma Ray Observatory in honor of the Nobel Prize-winning American physicist.

"We're having a dream mission with the Compton Observatory," said Dr. Neil Gehrels, project chief scientist of Goddard Space Flight Center. "The spacecraft is working fine, the instruments are performing splendidly, the gamma ray sky has been very active this summer, and finally, most important, the scientific results are spectacular."

One of the most startling discoveries was made by the Burst and Transient Source Experiment, which has rendered the most widely held theory about their origin "dead or at least in serious need of first aid," Gehrels said.

BATSE's principal investigator, Dr. Gerald Fishman of Marshall Space Flight Center, said readings show gamma ray bursts are much more frequent and not clustered along the plane of the galaxy or near the galactic center as had been expected.

Fishman reported that 117 bursts, lasting from a fraction of a second to hundreds of seconds, have been recorded since April, and that they are uniformly scattered throughout the sky.

"This surprising result indicates that the sources of gamma ray bursts are not associated with the large scale structure of the galaxy," Fishman said. "They are either much nearer than we had thought, or much, much farther away. We do not yet know which."

The BATSE observations included numerous weak bursts, and do not support the theory that they are associated with neutron stars.

"It could very well mean that gamma ray bursts represent a new type of object or phenomenon previously unknown or undetectable in other wavelengths," he said.

The Oriented Scintillation Spectrometer Experiment has recorded anti-matter-matter annihilation and a gamma ray glow in the disk of our galaxy that does not fit theoretical predictions, Gehrels said, and the Energetic Gamma-Ray Experiment Telescope has discovered what is by far the most luminous and most distant quasar yet seen.

The quasar emits 100 times the energy of our galaxy, with more in the gamma ray spectrum than our galaxy emits in all spectra.

"We are probing untrod territory with GRO, and we expect to be routinely surprised and intrigued by what we find," said Lennard Fisk, NASA's associate administrator for space science and applications.

Space Family Education has new directors

Space Family Education Inc., which manages the JSC Child Care Center, recently installed a new board of directors.

New board members are Ann Bufkin, president; Dorothy Rasco, vice president; Randy Redford, policies and procedures chairman. They will join current board members Kelle Pido, treasurer, and Reese Squires, secretary.

Outgoing board members are Mike Evans, who was board president, and Lori Beauregard, former policies and procedures chairman. Both had served on the board since 1989 and were instrumental in development of the Child Care Center.

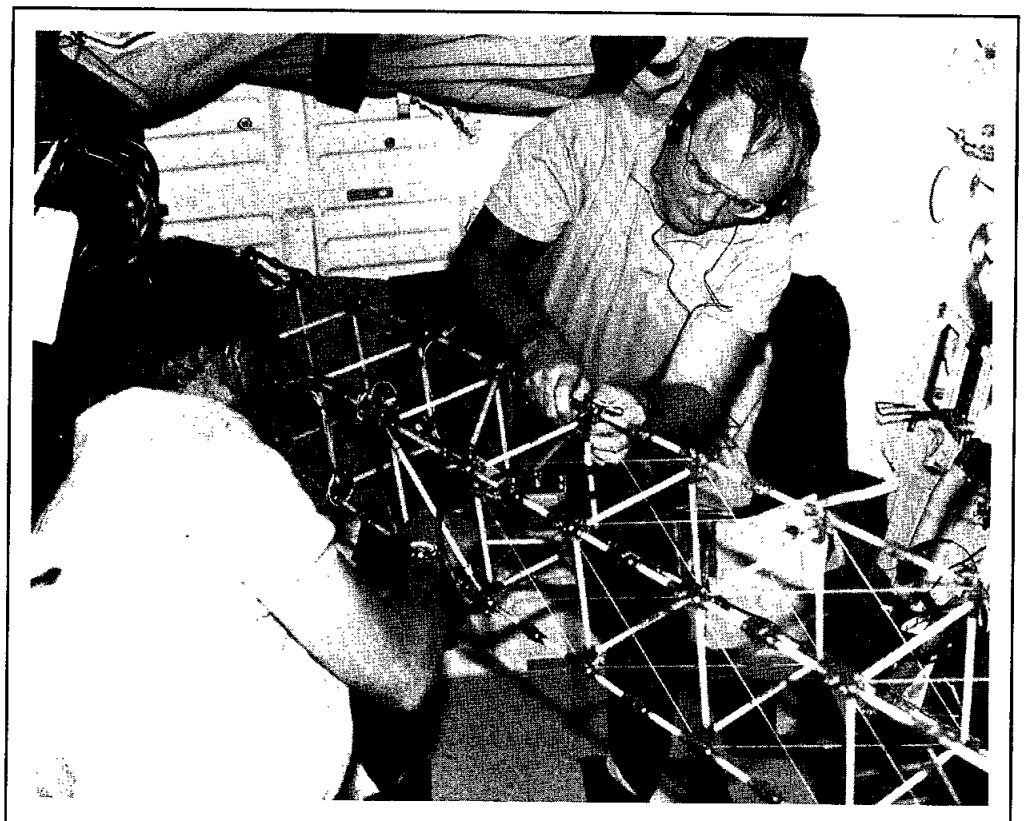
Due to the board changes, individuals wishing to be added to the center's waiting list should contact Redford at x36535.

For more information, contact Georgia Strain, the facility director, at x34734.

Military awards ceremony

Lt. Gen. Thomas S. Moorman, commander of the Air Force Space Command, will present military citations to astronauts at 4:30 p.m. Wednesday in Teague Auditorium.

All employees are invited to attend as their work loads permit.



NASA Photo

TRUSS TRIAL — STS-48 Mission Specialists Mark Brown, left, and Jim Buchli put together one of the mission's structural test articles as part of the Middeck 0-Gravity Dynamics Experiment. The heavily instrumented model of a space station truss structure was used to study vibration and strain on the structure as it moved in weightlessness. Data from the tests will be used to help engineers design the trusses that will connect modules on Space Station *Freedom*. The crew, which also includes Commander J.O. Creighton, Pilot Ken Reightler and Mission Specialist Sam Gemar, plans to brief fellow JSC employees on the recent mission at noon today in Teague Auditorium.

Lunney earns Gilruth award for leadership

Glynn Lunney, vice president and general manager of Houston operations for Rockwell International's Space Systems Division, will receive this year's Robert R. Gilruth Award.

Presented by the North Galveston County Chamber of Commerce, the award honors "inspired leadership, dedication and vision in leading America's space program in the 21st Century."

The award will be presented at the fourth annual Space Flight Banquet at 7:15 p.m. Oct. 11 at the South Shore Harbour Resort and Conference Center. Astronaut Charlie Bolden will be the keynote speaker, and JSC Public Affairs Director Harold Stall will be master of ceremonies.

Lunney

Lunney, also president of Rockwell's Space Operations Co., Houston, oversees the company's performance on three major NASA contracts, and the 4,000-person Space Transportation System Operations Contract.

Lunney left JSC for Rockwell in 1985 after 27 years with NASA. He was a member of the Space Task Group that moved from Langley Field, Va., to Houston in 1962 to form JSC. He became a flight director in 1964 and chief of the Flight Directors' Office in 1968.

In 1973, Lunney became manager of the Apollo Spacecraft Program, and in 1975, he began managing the Shuttle Payload Integration and Development Program. He was assigned to NASA Headquarters in 1976 as deputy associate administrator for space flight, and acting associate administrator for Space Transportation Operations in 1979. In 1981, he became manager of the National Space Transportation System Program, a post he held until leaving NASA.

Quality forum airs Tuesday

JSC employees will be able to watch the National Quality Month Forum VII from 9 a.m.-noon Tuesday in Teague Auditorium or on their nearest television monitor.

NASA Administrator Richard Truly will kick off this year's forum, dedicated to "World-Class Quality," at 8:50 a.m. CDT.

The keynote address will be presented by John Akers, chairman of IBM and National Quality Month. Other speakers will include Dr. Eberhard von Kuenheim, chairman of BMW AG; John Cleghorn, president of Royal Bank of Canada and Hiroshi Hamada, president of RICOH Co. Ltd..

The telecast will be aired live on Channel 4 of the JSC Television Distribution System.

CLIPS applications are varied, widespread

(Continued from Page 1)

CLIPS, which also involved the work of Chris Culbert, Brian Donnell, Beby Ly and Frank Lopez, was an outgrowth of the former Mission Support Directorate's artificial intelligence group's work in the 1980s to apply modern computer technology to the space program. The programs available weren't suitable for the NASA environment, which uses many different computers and has mountains of existing programming code.

Those same requirements turned out to be important to a lot of other potential users. To date, CLIPS is being used by some 3,000 people in business, academia and government, including all NASA centers, all branches of the military, numerous federal bureaus, 160 universities and many companies. CLIPS holds the record for the largest Space Act Award ever — $40,000.

"We thought it would be primarily used for aerospace applications, but we've seen papers from people working with blood cytometry, genetics research, meat inspection. Cray Research is using it for an expert diagnostic and maintenance system for the Cray III supercomputer. At Texas A&M, they have a system for forecasting southern pine beetle infestations."

CLIPS can be purchased for $490 through NASA's Computer Software Management and Information Center. Typically, when a company buys software it gets only the final product. When someone buys CLIPS, they also get the source code so that it can be more easily modified to serve their needs.

At least three companies have been formed on the basis of distributing or adapting CLIPS for specific uses, Savely said.

CLIPS is continuing its usefulness in the space program in the development of the first expert system scheduled to fly in space on Spacelab-2.

That project, called "PI (principal investigator) in a box," is developing a computerized assistant for the astronaut experimenter working with the "rotating dome" vestibular experiment, Savely said.

Work has begun on a related system, called the Task Analysis and Rule Generation Tool. TARGET can be loaded onto the front end of CLIPS and used to organize procedural knowledge.

Awards honor SEB participants

(Continued from Page 1)

Award recipients and the SEB on which they participated are:

Security Support Services: Ron Wade (chairman); James McGhee; Don Bray; Debra Griffin; Tim Boyes; Herb Rocha; and Charlyne Minick.

Institutional Automatic Data Processing (IADP): Charles Krpec (chairman); George Walker; Coty Whitener; Marianne Ruiz; Roy Hatch; Don Mitchell; Jason McAlpin; David Bell; Rosemary Thompson; Anne Modisette; and Liz Pieberhofer.

TV Support Services: Paul Coan (chairman); Katherine Autry; Vic Lucas; Michael McGuyer; Ed Tarkington; Wayne Thomas; and Jan Fearer.

Plant Maintenance and Operations: Earl Rubenstein (chairman); Bill Gieck; Dennis Perrin; Carol Smith; Herb Rocha; and Ginger Gibson.

New Initiatives Office Support: Lyn Gordon-Winkler (chairman); Bill Farries; Duane Emmons; Delene Sedillo; Anna Lord; Susan Lister; Jennifer Mason-Korecki; and Marion Campbell.

Program Compliance Assurance and Status System (PCASS): Ken Suit (chairman); Roy Hatch; Mark Hershey; Donna Lee; Blake Ratcliff; Jane Stearns; Wayne Thomas; Bobby Watkins; Debbi Gutierrez; and Yolanda Ramirez.

SEB review/coordination team: Bill Drastata; John Lottinville and Joyce Simmons.

Board announces senior promotions

JSC's Senior Promotion Board approved 21 nominees for dual career ladder promotions in September, based on expanding job responsibilities and scientific and engineering impact.

The promotions to the GS/GM-14 and -15 level were made separate from those selected through the Competitive Placement Plan in an effort to ensure that nominees from both paths receive consideration.

Those receiving promotions, which became effective Sept. 22, were:

Administration Directorate: David J. Westfall.

Flight Crew Operations Directorate: Lawrence R. Neu.

Mission Operations Directorate: Charles W. Dingell Jr., Mark A. Kirasich and Isaac W. Moore.

Engineering Directorate: Thomas D. Barry, Glenn M. Ecord, Richard D. Juday, Michael E. Montz, Robert J. Panneton, Larry P. Ratcliff, Carl I. Soderland and George A. Weisskopf.

Space Shuttle Program Office: Robert H. Heselmeyer.

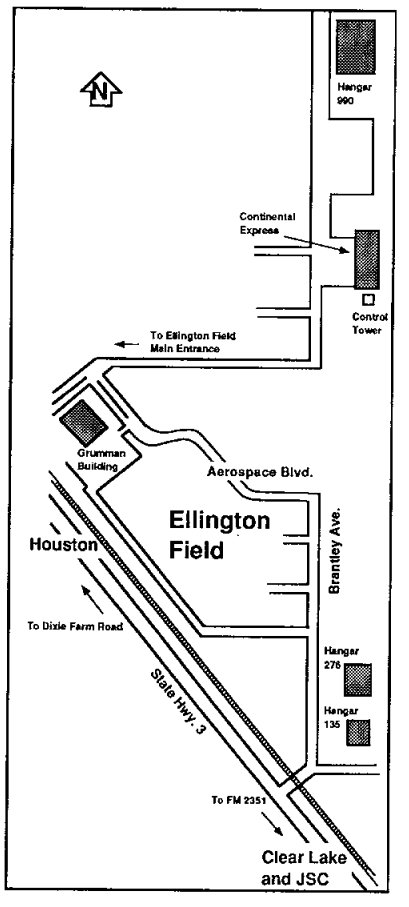
New Initiatives Office: Katherine E. Newkirk.

Space Station Projects Office: Elizabeth S. Smith.

Information Systems Directorate: Joseph E. Rogers.

Space and Life Sciences Directorate: Donald A. Morrison, Steven F. Siconolfi and J. Britton Walters.

Orbiter and GFE Projects Office: Stuart L. McClung.



Hangars change Ellington route

New construction at Ellington Field is changing the path that many JSC employees take when going to NASA's Hangar 990 or to the Continental Express terminal.

The easiest way to get to Hangar 990 or the airline terminal now is through Ellington's main entrance.

Ellington Assistant Superintendent Bob Hartman said Brantley Avenue has been permanently closed between the southwest entrance and Hangar 990. Two light aircraft hangars are being built on the west side of the street, and a taxiway will connect them to the runways, thus blocking the road.

The whole project is expected to be complete by June 1992.

The southwest entrance is still the best one to use if you're going to NASA Hangars 135 or 276 from the south, Hartman said.

The moves are part of the Ellington master plan, which calls for another taxiway south of Hangar 990, an instrument landing system on Runway 22 and a $3.5 million runway pavement repair project.