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

Common ground

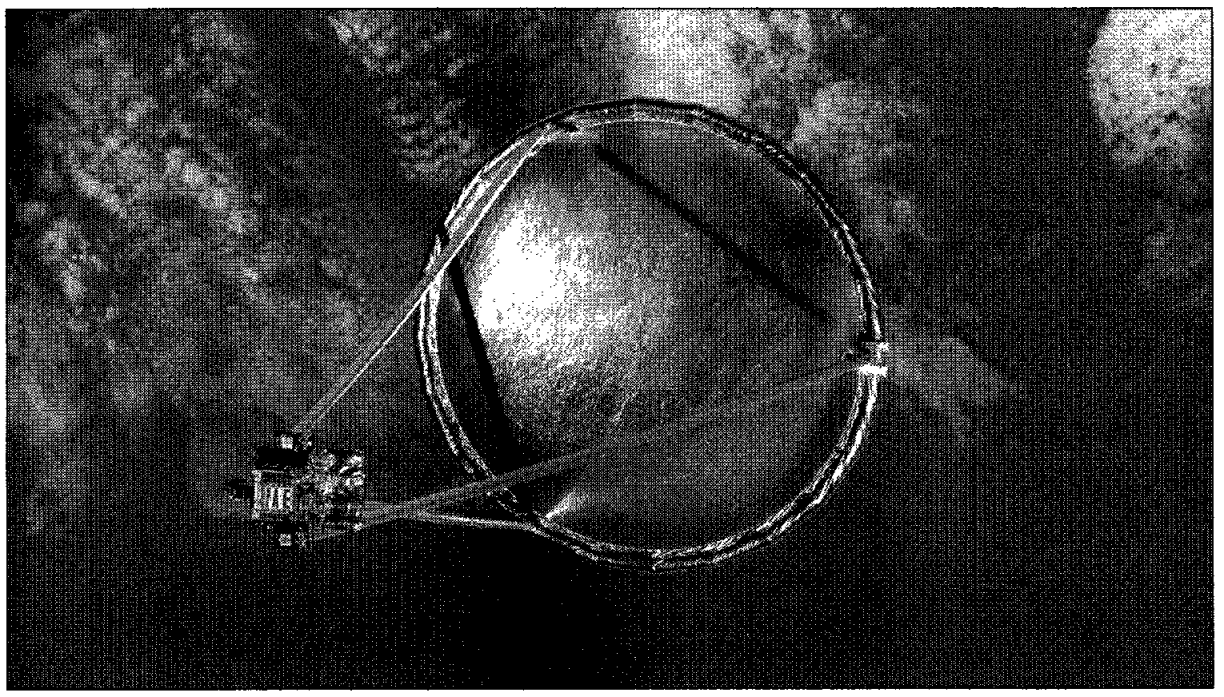
A new agreement by space station partners on life sciences hardware is an important first. Story on Page 3.

Cinco de Mayo

High school students entertain JSC lunch crowd this month. Photo on Page 4.

Space News Roundup

Vol. 35 | May 24, 1996 | No. 20



NASA Photo

Following its deployment from *Endeavour* on Monday, Spartan deploys the Inflatable Antenna Experiment. The inflation of the tennis court-sized antenna took about five minutes. After an hour and a half, the antenna was jettisoned from Spartan and reentered Earth's atmosphere Wednesday.

Endeavour crew accomplishes triple play job

By Karen Schmidt

Endeavour's crew accomplished a triple play of deployment, retrieval and rendezvous this week as the six astronauts met many of their STS-77 objectives more than halfway through their mission.

Commander John Casper and Pilot Curt Brown are performing some of the most precise flying to date to keep tabs on the Satellite Test Unit. Overall, three rendezvous will be performed to conduct experiments on the Passive Aerodynamically Stabilized Magnetically Damped Satellite, or PAMS.

PAMS was released Wednesday morning as Casper and Brown maneuvered the shuttle and Mission Specialists Mario Runco and Dan Bursch performed a variety of experiments.

"Our job on the shuttle is to rendezvous with the satellite three different times and to take measurements on how the satellite is stabilizing," Casper said during a preflight interview. "We'll track it four to eight hours at a time depending on the rendezvous and record that data on what the attitude is, how it's stabilizing, whether it's damping out or becoming less. Our challenge is to do this using minimum propellant or to use the propellant that's available onboard the shuttle—a big job, a big challenge in itself."

Endeavour will rendezvous with the STU over the weekend to continue to collect data from the satellite.

At the beginning of the week, Mission Specialist Mario Runco successfully deployed and retrieved the Spartan satellite. Spartan was released at 6:29 a.m. CDT for its 24-hour free flight from *Endeavour*. The Inflatable Antenna Experiment, or IAE, was inflated to its full 92 feet by 50 feet length in about five minutes. Spartan collected a variety of data for an hour and a half before the antenna was jettisoned from the free-flying satellite.

Early Tuesday morning ground controllers at JSC were able to view the antenna as it passed over JSC.

"We got a view of the Inflatable Antenna passing overhead," said Bill McArthur, spacecraft communicator on duty Tuesday as the IAE passed over JSC. "It was the brightest orbiting object most of us have ever seen. Three minutes later we saw a faint little Spartan streaking across the sky with *Endeavour* in hot pursuit."

The IAE was expected to reenter the Earth's atmosphere Wednesday. *Endeavour* was required to use more propellant than expected to keep up with the IAE once the antenna and Spartan unexpectedly rotated. But, retrieval of the Spartan

Please see ***COLUMBIA***, Page 4

Mir crew performs space walk to unfurl solar array

By Barbara Tomaro

The Mir 21 crew spent a week space walking to enhance power on the Russian Mir Space Station.

Commander Yuri Onufrienko and Flight Engineer Yuri Usachev ventured outside Mir late Monday, JSC time, to conduct a five-hour space walk, their second of the mission, to move a solar array. The array, jointly developed by the U.S. and Russia, was moved from the Docking Module to the Kvant-1 module. Another space walk will be conducted today to unfurl the array. A second array built by Russian engineers and housed on the Docking Module will be attached to Kvant-1 in the fall.

Meanwhile, the Mir-21 crew has been busy performing Mir upkeep and maintenance as it prepares Priroda for science operations. Priroda is now configured so the Mir 21 crew can start to get to work.

"This week we were able to check out the Biological Technology System and it worked very well," said Mir 21 Cosmonaut Researcher Shannon Lucid.

The equipment will be used on the next few flights to support the long duration biological experiments on the Russian outpost. It will record temperatures, keep track of gas composition, provide video tape and support all the experiments being planned.

The crew spent time checking out the Microgravity

Please see **STS-81**, Page 4

JSC prepares for second annual open house

The center will open its gates once again on Aug. 24 to say thank you to the Clear Lake and Houston-Galveston community for its continued support.

"This area has supported JSC and the space program for the last 30 years," said JSC Director George Abbey. "We want to give them an opportunity to see, first-hand, the exciting, cutting-edge work that we are involved in here."

The 1996 Open House once again will be held in conjunction with the Ballunar Liftoff, sponsored by Space Center Houston and the Clear Lake Area Chamber of Commerce.

"The two events are a natural pairing," said Kari Fluegel, planning committee chair. "As the morning Ballunar activities wind down, the open house activities get started. That gives people an opportunity to participate in both events."

In 1995, the first year for the JSC Open House, more than 70,000 people came through the center's gates.

For this year's event, 19 JSC buildings will be open for exhibits and presentations. The 1996 Open House also will feature activities at both Ellington Field and the Sonny Carter Training Facility, where visitors will have their first opportunity to see the world-class Neutral Buoyancy Lab that will be used to train astronauts for future space walks. At 201-by-102-foot and 40-foot-deep, the 6.2 million gallon pool is the largest indoor pool in the world. It took 528 cement trucks 24 hours to pour the cement for the pool and one month of constant water flow to fill the pool.

Many of the activities that were favorites during the 1995 Open House will return and be expanded this year including tours of both the old and new Mission Control Centers and the shuttle simulators in Bldgs. 5 and 35. In Teague Auditorium, the center will host a series of special presentations focusing on the accomplishments of the past year and exciting plans for the future. Special educational activities for children also are being planned, and astronauts will sign autographs

Please see **NEW**, Page 4

JSC engineers, students race solar powered cars

Fifth-grade students at Ed White Elementary School highlighted a week spent working with seven NASA engineers to design and build solar-powered model cars with a race of the models last Tuesday in the school's parking lot.

The innovative educational project, called "Solar Power Up," was sponsored by the Texas Solar Energy Society, which provided solar cells, motors, gears and other parts for the model cars. In addition to teaching students about alternate energy sources, the project teaches students to work in engineering design teams and make group engineering decisions as they construct the models.

"It was really fun for both the students and engineers," said Mike Ewert of JSC's Crew and Thermal Systems Division. "On Tuesday, the sun kept going in and out of the clouds and the kids were able to see first had how the sun powered the cars."

The seven NASA engineers assisting with the project included Ewert, Cindy Cross, Mike Rouen, Joe Kosmo, John Cornwell, Jeff Dominick and Betsy Kluksdahl. Except for Kluksdahl, all are from the Crew and Thermal Systems Division, which designs space suits, spacecraft life support equipment and spacecraft cooling equipment, among other engineering tasks. Kluksdahl works in JSC's Propulsion and Power Division, which designs spacecraft thrusters and electricity-generating systems.

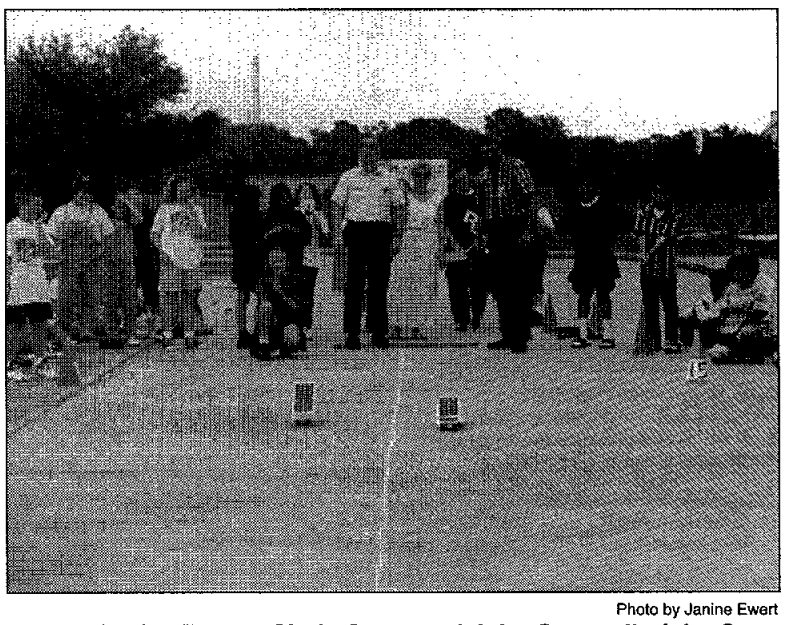


Photo by Janine Ewert

From left Mike Rouen, Cindy Cross and John Cornwell of the Crew and Thermal Systems Division watch behind the start line as students race solar powered cars they design with the help of JSC engineers.

Travel Fair gives away variety of prizes

The 1996 Travel Fair was attended by more than 600 people and several went home with prizes.

"The fair was an overwhelming success," said Ginger Gibson, Employee Activities Association president.

Roundtrip airline winners were Robert Newmann of Safety, Reliability and Quality Assurance; Sally Robinson of Krug and Sandra Foerg of the Engineering Directorate.

Several employees won weekend get-a-ways including a three-days in Cozumel won by Sandra Kokosz. Other winners included Matrenia Anumele, Mary Proudy, Rich Hall from the Business and Information Systems Directorate; Claramita Haefner of the Space Shuttle Program Office; John Dusl of Flight Crew Operations; and Donald Tillian of the Engineering Directorate.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Astroworld: One day pass costs $17.25.

Fiesta Texas: One day pass costs $17.25.

Six Flags: One day pass costs $17.25.

Sea World: Adult tickets cost $24.50, Children (3-11) cost $17.25.

Space Center Houston: Discount tickets, adult, $8.75; child (3-11), $7.10.

Movie discounts: General Cinema, $4.75; AMC Theater, $4.50; Sony Loew's Theater, $4.75.

Stamps: Book of 20, $6.40.

JSC history: *Suddenly, Tomorrow Came: A History of the Johnson Space Center.* Cost is $11.

Metro tickets: Passes, books and single tickets available.

Upcoming events: Caribbean Getaway Sept. 13-20. Cost is $359. Deposit of $200 due July 8. Mexico Cooper Canyon Trip Nov. 6-12. Cost is $995. Deposit of $200 due Sept. 6.

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 NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

EAA badges: Dependents and spouses may apply for photo identification badges from 7 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

Golf instruction: Group Golf Clinics throughout spring and summer at Clear Lake Golf Club.

Fitness Challenge: 1996 Fitness Challenge runs to Aug. 31. Employees are eligible to win $100 gift certificates. For more information call Larry Wier at x30301.

Defensive driving: One day course is offered once a month. Cost is $25. Interested employees should call the Gilruth.

Stamp club: Meets at 7 p.m. every 2nd and 4th Monday in Rm. 216.

Women's self defense: Martial Arts training for women only from 5-6 p.m. Tuesdays and Wednesdays. Cost is $25 a month.

Weight safety: Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. June 13. Pre-registration is required. Cost is $5.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays.

Aikido: Martial arts class meets from 6:15-7:15 p.m. Tuesday and Wednesday. Cost is $25 per month. New classes begin first of each month.

Aerobics: Class meets from 5:15-6:15 p.m. Monday, Tuesday and Thursday. Ballroom dancing: Cost is $60 per couple. For additional information call the Gilruth Center at x33345.

Country and Western dancing: Beginner class meets 7-8:30 p.m. Monday. Advance class meets 8:30-10 p.m. Monday. Cost is $20 per couple.

Fitness program: Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

JSC

Dates & Data

Today

Cafeteria menu: Special: meat sauce and spaghetti. Total Health: baked potato. Entrees: rainbow trout, liver and onions, beef cannelloni, ham steak, fried cod fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: steamed broccoli, breaded okra, cut corn, black-eyed peas.

Monday

Memorial Day: Most JSC offices will be closed for the Memorial Day holiday.

Tuesday

BAPCO meets: The Bay Area Personal Computer club will meet at 7:30 p.m. May 28 this month in the Community Room of the League City Bank and Trust Co. at 300 Main St. in League City. Guy Thibodaux will discuss "Photography using Computers." For information call Guy Thibodaux at 333-5340.

Cafeteria menu: Special: pepper steak. Total Health: barbecue chicken. Entrees: baked lasagna, pork chop and fried rice, turkey a la king, baked chicken, fried cod fish, French dip sandwich. Soup: black bean and rice. Vegetables: breaded squash, steamed spinach, baby carrots, navy beans.

Wednesday

Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. May 29 at the House of Prayer Lutheran Church. For more information call Jeannette Kirinich x45752.

Astronomers meet: The JSC Astronomy seminar will meet at noon May 29 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information call Al Jackson at x35037.

Cafeteria menu: Special: Mexican dinner. Total Health: steamed pollock. Entrees: broccoli cheese quiche, spare ribs and sauerkraut, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: Spanish rice, pinto beans, peas, broccoli.

Thursday

Radio club meets: The JSC Amateur Radio Club will meet at noon in Bldg. 16, Rm. 253. For more information call Larry Dietrich at x39198.

Cafeteria menu: Special: hamburger steak with onion gravy. Total Health: baked potato. Entrees: corned beef, cabbage and new potatoes, chicken and dumplings, meat ravioli, French dip sandwich. Soup: broccoli cheese and rice. Vegetables: navy beans, cabbage, cauliflower, green beans.

Friday

Cafeteria menu: Special: tuna noodle casserole. Total Health: broiled chicken breast. Entrees: deviled crabs, broiled pollock, liver and onions, broiled chicken with peach half, Reuben sandwich. Soup: seafood gumbo. Vegetables: Italian green beans, cauliflower au gratin, steamed rice, vegetable sticks.

June 4

ABWA meets: The American Business Women's Association, Clear Lake Area Chapter, will meet at 5:30 p.m. June 4 at Bay Oaks Country Club. For more information call Nancy Hutchins at x34006.

June 6

Warning system test: The site-wide Employee Warning System will under go its monthly audio test at noon June 6. For more information call Bob Gaffney at x34249.

June 12

MAES meets: The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. June 12 in the Bldg. 3 Cafetera executive dining room. For more information call Michael Ruiz at x38169.

June 13

NPM meets: The National Property Management Association will meet at 5 p.m. June 13. For more information and meeting location call Marie-France Smith x39309.

Airplane club meets: The Radio Control Airplane Club will meet at 7:30 p.m. June 13 at the Clear Lake Park Community Bldg. For more information call Bill Langdoc at x35970.

June 14

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. June 14 at the Lunar & Planetary Institute, 3600 Bay Area Blvd. For more information call Chuck Shaw at x35416.

June 19

Scuba club meets: The Lunarfins will meet at 7:30 p.m. June 19 at Redfish Restaurant under the Kemah/Seabrook Bridge, Seabrook Side. For more information call Fred Toole at x33201.

June 20

Directors' meet: The Space Family Education board of Directors will meet at 11:30 a.m. June 20 in Bldg. 45, Rm. 712D. For more information on this open meeting call Gretchen Thomas at x37664.

June 27

Radio club meets: The JSC Amateur Radio Club will meet at 7 p.m. June 27 at the Nassau Bay City Hall Bldg. For more information call Larry Dietrich at x39198.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP2, or deliver them to the deposite box outside Rm. 181 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: 130 cleared acres, 5 pastures, 15 mi East of Tyler, house, hay & horse barns, divide, all amenities. 488-5058.

Sale: Hilltop Lakes Resort City, 2 adjacent wooded lots, golf/fishing/landing strip, $2.5k both. 486-7380.

Sale: Clear Lake, large 4-2-2, formals fenced, near school/park/pool. 282-3479 or 532-1112.

Lease: CLC University Place town house, 1327 sq ft, 2-2.5-2, hi-eff A/C, FPL, W/D, refrig, no pets, $800 mo. 488-1036.

Rent: League City, Pecan Forest, 3-2-2, FPL, extra clean, no pets, $850 mo. 554-6200.

Sale: Canyon Lake, 3-2, 1800 sq ft, rock FPL, 1200 sq ft deck storage under house, 12x12 gazebo, waterfall, satellite dish, $124k. 210-899-3447 or 520-1777.

Sale: Dimebox, TX, 26.8 acres, 28'x70' dbl wide, 3-2-2D, FPL, porch, utility bldg, barn, 2 large ponds, cross-fenced, coastal grass. 473-0117.

Sale: Webster, 2-2-2CP, condo, upstairs flat, new A/C, kitchen & bath upgrades, woodburning FPL, full sz W/D conn, $37.5k. 280-0285.

Sale: Clear Lake condo, 1-1, E/D, FPL, good cond, close to NASA. Ruben, x47119 or 486-0817.

Sale/Lease: Condo on Space Center Blvd, access gates, 1-1- w/study/CP, alarm. 977-5763.

Rent: House off Fuqua & Monroe, 3-1, $450 mo. Mike, x38169 or 482-8496.

Sale: LC, Bayridge, foreclosure, cul-de-sac street, new roof, $55k obo. James, 286-1934.

Sale/Lease: Bay Glen, CLC, 3-2-2, close to school & pool & park, $105k/$1050 mo. x38274 or 486-5072.

Sale: Brook Forest, 4-2-2, 2300 sq ft, FPL, new carpet & tile/fence/A/C/H, $125k nego. Brian, x32635 or 480-4351.

Rent: Condo in Winter Park, CO, 2-2, sleeps 6, hot tub/heated pool, low summer rates. 488-4453.

Rent: Arkansas cottage in the woods overlooking Blue Mt Lake & Mount Magazine, furn, massive FPL, scenic views, $50 dly or $250 wkly. Corcoran, x47806 or 334-7531.

Rent: Beach house, Crystal Beach, TX, Galveston county, furn, cable T/V, wkly/wkend rates. 486-1888.

Rent: Galveston condo, Seawall & 61st St, furn, sleeps 6, cable TV, daily/wkend/wkly. Magdi Yassa, 333-4760 or 486-0788.

Sale: Memorial Oaks Cemetery, 4-spaces in lot 15, sect 7, 2 each side-by-side call for prices & location. 903-584-3575.

Cars & Trucks

'93 Nissan 240sx Sport Coupe, maroon, ex cond, new tires/brakes, auto, A/C, AM/FM/cass. extended warranty. 41k mi, $10.9k. x37732 or 488-5352.

'94 Probe GT, white exterior/black inter, 29k mi, cordless remote control Pioneer CD changer, sunroof, alarm, $13.8k nego. 286-1785.

'86 Honda Prelude Si, sunroof, red/black, alarm, auto, cruise, A/C, good cond, tinted windows, $3k. Lisa, x40213 or 554-4140.

'80 Subaru, good work/school car, runs better than it looks, $700 obo. Mike, x34823 or 474-5252.

'96 Monte Carlo, maroon, grey interior, bucket seats, P/W & P/L, A/C, CD, 3.7k mi. Mike, 244-1866.

'66 Chevy PU, LWB, 350/350, tilt, P/S & P/B, AM/FM/cass, A/C needs work, needs body work & paint, $1.8k. 992-0938.

'93 Toyota Celica GT, sunroof, alarm, ex cond, low mi, garaged, $13.5k. 326-1526.

'91 Jaguar Sovereign, dark metallic blue/blue, ex cond, 83k mi, loaded, $13k. 992-3014.

'92 Chevy Lumina, Euro 3.4, black w/grey inter, sport instrumentation, all options, AM/FM/cass, alarm, ex cond, 1 owner, $8k. Ron, x33196.

'92 Honda Prelude SI, 48k mi, $11.5k. 286-2128.

'83 Toyota Tercel, white, 5 spd, A/C, AM/FM/cass, 149k mi, runs good, $1.5k obo. Eric, x39055 or 334-4770.

'83 Dodge van, custom inter, good camper, very dependable, $2.2k obo. Ken, x31496 or 286-7583.

'90 Mustang GT convertible, auto, alarm, CD, low miles, 1 owner, ex cond, $14.5k. 334-3066.

'86 Ford F-150 extended cab XLT package, 302 V8, capt chairs, bedliner, A/C, radio/cass, new tires, ex cond, $4.5k. 451-2528.

'94 Firebird, 6 cyl, 5 spd, AM/FM/CD, alarm, 29k mi, green, airbags, tinted, ABS brakes, ex cond, $10k. 280-2246 or 534-6750.

'88 Cadillac Fleetwood, loaded, electric, non-smoker, ex cond, 61k mi, 1 owner, $8.9k. 331-0249 or 244-9737.

'83 Toyota Tercel, white, 3 dr, 5 spd, 1 owner, A/C, AM/FM/cass, 149k mi, runs great, some cosmetic work needed, $1.5k obo. Eric, x39055 or 344-4770.

'89 Crown Victoria LX, cream exterior/beige interior, V8, 68k mi, great cond, all pwr, loaded, $5.8k. 333-0267.

'78 Dodge Jamboree motorhome, P/S & P/B, auto, A/C, sleeps 6, microwave, rebuilt engine, fridge, bath w/shower, ex cond, $6.1k obo. x36461 or 337-9218.

'90½ Bounder, motor home, 34', TV's/VCR, awning, gen, loaded, 19k mi, ex cond, new tires, stored, $33k. Jim, x31600 or 482-1461.

Boats & Planes

'91 20' Red Fin Euro w/115Hp Johnson, center console, full tunnel hull, live well, depth finder, Sportsman galvanized trailer. Charles, 559-2331.

'92 Kawasaki 750cc Super Sport Waverunner, trailer, life vest, $3.5k. 488-2184.

Cycles

'85 Honda 1100 Shadow motorcycle, runs, but needs work, best offer. 975-9597 or 820-4899.

'82 Suzuki GS650L, stored for years, just tuned, showroom cond, $1695 obo. 332-6701.

Ross Grand Tour 10 spd training bike, $75. Rob, x41027 or 334-3529.

Audio Visual & Computers

Mac Performa, 635 CD, 8MB RAM, 250MB HD, Mac color monitor, keyboard, mouse, MS Office 4.2, $800; Mac Powerbook 145b, 8MB RAM, 80MB HD, 2 batteries, ex cond, $795. Bobby, x42444 or 488-4382.

RCA TV, 24", table model, works well, $75. Doug, x48851 or 486-7412.

Computer 486/33, 4MB RAM, 130MB HD, dual FD, DOS 5.0, Win 3.1, Quicken, Falcon 3.0, Int. fax, $500. Ray, 332-3243.

Mac Performa 450, 25MHz, 4MB RAM, 512 NB HD, 14" color monitor, keyboard, 1.4MB FD, complete documentation, ex cond, $725. x41791 or 488-1326.

Colorado-T1000e external tape backup, 800MB capacity, ex cond, $150. Andy, x31596.

TI-81 Graphing Calculator, ex cond, w/instruction manual, $40. Mike, x34823 or 474-5252.

Smith Corona Personal word processor w/ Corona-Calc, extras, warranty, $245. 602-4005.

486/33MHz, 4MB, 210 HD, 3.5 FD, modem, keyboards, mouse, Microsoft Windows, DOS 6.22, $450. x30484 or 486-5499.

Apple IIe computer, 2 FDs, joy stick, epson printer, games, kids educational S/W, $50 obo. x37467.

Pioneer Premier DEQ-7500 DSP audio processor, 9-band spectrum analyzer, 4-band parametric equalizer, 7-band graphic equalizer, 5-mode sound field control, optical digital input, subwoofer output, center channel output, wireless remote control, $250. Brian, 996-8567.

Audio control 2XS 2-way 18dB/octave programmable electric crossover w/subsonic filter, $50; audio control EQL series II dual bandwidth equalizer, 13-bands, trunk mounted, $100; Rockford Fosgate series 1 loudspeaker 8" woofer, 4 ohm, $10; all ex cond. Brian, 996-8567.

Pets & Livestock

Lab puppies, AKC black & yellow, born 4/3, available 5/12, shots, wormed, $200 - $250. x48123 or 409-925-7869.

Aquarium fish: large Clown Knife, $75; African Rope fish, $9; African & Neotropical Cichlids, $5-$10; 2 large sump filter system, $500 both. David, x40211 or 488-4876.

Great Pyrenees, male, neutered, housebroken, needs large yard, current shots. Lisa, x40213 or 554-4140.

Household

Bedroom set, full size, antique green w/dresser, 5 drawers chest & 2 night stands, Italian design, great cond, $950. Magdi Yassa, 333-4760 or 486-0788.

Burgundy, navy & cream River Oaks queen sofa sleeper & loveseat, ex cond, $800 obo. Tony, x47401 or 482-4156.

Glasstop dinette, 3'x5' w/4 caneback chairs, $75 obo. 486-7621.

Novi American 38" NEO angle shower mate deluxe, clear glass front w/gold stripes, $375. Ray, 332-3243.

Queen size futon bed & frame, good cond, $250. x31644 or 488-2616.

Leather executive chair, 2 desk, 3 occasional tables, waterbed, swivel rocker chair. 488-3856.

19" color TV w/remote, works great, $60. Jerry, x34407 or 482-5531.

King size waterbed w/extra heater, wood headboard & side rails, $125. Ann, 488-8348.

Solid oak bedroom furniture, 7' dresser w/mirror, Armoire & side chest, $600; futon w/frame, $50; two decorative upholstered chairs, $350. 326-1526.

GE 30" electric stove top, working, $35 obo. x36090 or 488-7427.

Couch & 2 Lazy Boy rocking chairs, ex cond, $1k obo. x36198 or 333-7720.

Solid oak Western style family room furniture, 6 pieces, $550. 286-0022.

Coffee table, extra heavy imported thick glass, oriental style, $350; love seat, ex cond, $350. 488-5564.

Queen size waterbed bedroom set, dark wood, motionless mattress & heating pad, 6 underdrawers, headboard w/compartment, 2 night stands, armoire chest, dresser w/hutch, $950. 992-4903.

Couch/sleeper, love seat, chair, $300; chest, mirror/dresser, 2 nightstands, $300; Wurlitzer spinet piano, ex cond, $900. 280-2246 or 534-6750.

Want Ads

Want non-smoking female to share 3-2-2 with same, $350 deposit, $300/mo includes all utilities except phone. 322-8417.

Want non-smoking roommate to share 4-2.5-2 house in Bay Glen Manor, Clear Lake City, $300 mo + dep w/bills pd. x38274 or 486-5072.

Want non-smoking roommate to share 3-2-2, League City, $250 + 1/3 utilities. Rob, x41027 or 334-3529.

Want non-smoking roommate to share 4-2, Friendswood, w/others, cable, W/D, microwave, VCR, gas grille, household privil, $250 mo, all bills pd. Michael, x38169 or 482-8496.

Want housemate to share large house in Meadowgreen, own bathroom, pool & jacuzzi, $300 mo +1/3 utile. Ken, x31496 or 286-7583.

Want roommate, prefer female, to share 3-2-2, Pasadena, smokers ok, bills paid except long distant calls, $400 mo. Tamela, x36155.

Want personnel to join vanpool departing Sugar Land/Southwest Houston, for JSC & contractors sites. Alice, x35234.

Want personnel for VPSI vanpool, departing. Braeswood Park & Ride at 6:50 am for JSC/offsite locations, 7:30 - 4:30. Susan Gaynor, 282-5447 or Al Ruder, x34997.

Want ride to & from work, willing to pay gas expense, Pasadena, Richey area, 7:30 a.m. - 4:00 p.m. x48871 or 472-5205.

Want Wind Berg, "Pelican's Wharf". x30626.

Want space memorabilia, flown items e.g. utensils, clothing, autographs on photos, covers, letters, relating to Mercury - Shuttle. Richard, 481-8080.

Want Nikon, Canon, Pentax cameras, lenses, access, working cond, to teach high school students, reasonable prices. Steve, x37152 or 992-7049.

Want motorcycle (dirt bike) running or not. 244-7188 or 334-3961.

Want part-time babysitter, Seabrook area, pay is negotiable. Sharon, 474-9155.

Want small utility trailer; car-top carrier; acoustic guitar case. 338-2651.

Want Hill Country retiree's, referral database (free) is in work for continued professional contact, to register & obtain a listing, send SASE to Registry, 2103 Kilkenny Dr., Pearland 77581.

Want low priced school/work car/truck, prefer Japanese. 272-7011.

Miscellaneous

U.S. mint commemorative stamp sheets, mostly .5 - .15 cents sheets, some duplicate, $490. Jeff, 482-5393.

Wells Fargo trailer, boxed, 6x14 w/side & rear door, good cond, $2,195. Carl, x49611 or 448-4222.

Spalding baby-toddler bike seat, $18; toddler bike helmet, $10; Evenflo car seat, $15. 538-3190.

18' single axle flatbed car trailer, $600 obo; baseball cards/sets collection, $600 obo. Tony, x47401 or 482-4156.

Rabbit hutch, 2'x2'x2', $20. 480-1266.

Panda Coin ring, 14Kt; 14Kt Marq Rainbow band ring, $80 each. 554-6138.

Sofabed & loveseat, $130; end table, $45; dresser w/mirror, $75; coffee table, $40; dishwasher, $50; boys bikes, $40; toddler bed & mattress, $60; sofa table, $55, all in good cond. 486-1888.

Sega Genesis w/2controllers, $125 obo; men's black leather coat, full-length, sz 42, removable liner, ex cond, $150 obo. 332-7427.

Desk w/3-drawer file & credenza, white, $100; electric typewriter, $25; booster carseat, $15; 16" boys bike, $25; misc toddler toys. 487-1883.

Weedeater 17" gas powered trimmer, ex cond, $50. x32920 or 992-3014.

Pop-up camper, very good cond, $2.4k; external frame backpack, ex cond, $40. Jim, x30411 or 480-2646.

Traditional white wedding dress w/beads & long train, sz 7, $600. 764-2365.

Bridal set, engagement ring, 1/3 ct center diamond Trillian w/baguettes, 0.73tdw diamond ring, wedding ring 0.06tdw, 14kt gold, appraisal value over $3.5k sell $2k. Marie-France, x35175 or x36528.

Four 6JX14 alloy wheels & covers, fits '89 Mustang or any equivalent car, $200 for all; hamster or equivalent cage, $15; 2 suitcases, Samsonite, $35 both; Paymaster Check Writer, $20. 488-5564.

Queen size waterbed, full wave, 6 drawer base, heater, dark wood finish, $75 obo; 10 gallon fish tank, nice wood stand, heater, pump, filter, etc, $50 obo. Julie, x38866.

Mattress/boxsprings, ex cond, $100; two tennis rackets, $10; under the counter can opener, $10; speakers, 17.5"x16.5"x11", $50. 332-0036.

Treadmill, ex cond, Lifestyler 8.0, 0-8 mph, 1.25 Hp DC motor, $275; Prickly Pear cactus in matched pots, beautiful plants, $20 pr. Bob, x33149 or 488-7036.

Epson FX-86e, $100; answering machine, $35; Bear compound bow w/sight, 35 lb pull, 26" draw & 11 flights, $125. 332-0036.

Golf clubs, 3 woods, 8 irons, putter, ex cond, bag cart, balls, $85 all. 486-7380.

Free Mexican bricks, approximately 200, must take all. Nicholas, 282-3307 or 486-4016.

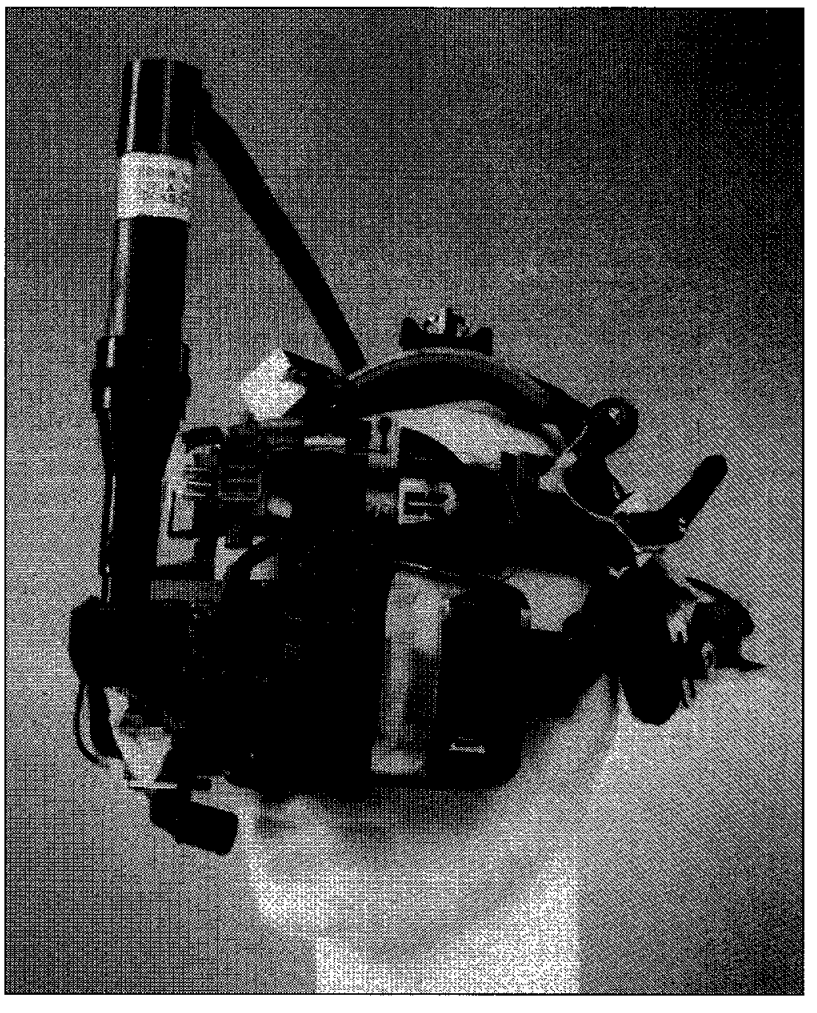
Pro Sport MX50 stair stepper, $50 obo. x37467.

Stepper/climber, digital readout, adjustable to any height, sale or trade for treadmill, new $269 sell $100 obo. 451-2528.

Ping Zing 2 irons, 1-SW, $500 obo; Callaway tuttle putter, $75; Graphite metal woods 1,3,5, $100; President & First Lady Charter Gold membership, $450 firm. Kyle, x38653.

Common Ground

Historic agreement paves way for shared science instruments



JSC's Human Research Facility will coordinate the assembly of a generic set of hardware—developed by individual partner countries— that researchers can use to conduct human life sciences investigations aboard the International Space Station.

Left: The German-built 3-D Eye Tracking System may be used in human factors research as a method of tracking visual search patterns of displays, providing input to a multimedia computer for controlling displays or driving external servo-systems, and for visual/vestibular experiments.

Bottom right: The French-built Kinelite Head and Body Tracking System will be used to analyze the crew motion and monitor all exercise equipment, force/torque measurement equipment, movement in module, and workstation position and movement.

Bottom left: Germany also is building the Lower Body Negative Pressure device which provides an orthostatic tolerance measurement device for cardiovascular research.

By Barbara Tomaro

When laboratory space is at a premium—as it will be on the International Space Station—it isn't logical or cost effective for everyone to bring the same equipment. That's why a new agreement by space station partners on a generic set of life sciences hardware is such an important first.

With the broader context of human efforts in space becoming more focused on international cooperation, it is only one of many important firsts being achieved through the combined efforts of U.S. and international partners.

"You don't need five treadmills up there, just one," said Tim White, assistant to the director of space and life sciences for space station. "If we're going to bring a treadmill, we ought to let other people use it. If we need an electrocardiogram or some other device and someone else wants to build it and has the expertise, then Headquarters said let them bring theirs and we'll use it."

Because all life science research programs are similar, many of the investigators will want to look at the same things. The research and science community recognizes the opportunities and the necessity for international cooperation, White said. None of the participants have infinite budgets, and everyone agrees about the need to have as much different life science equipment as possible in orbit and available to everyone.

NASA Headquarters directed JSC's Space and Life Sciences Directorate to initiate a cooperative effort in human life sciences that will make generic research hardware accessible to domestic and international participants while optimizing the amount of science that can be accomplished within the available resources of the station.

To facilitate this, JSC is working with NASA's international partners to develop the Human Research Facility. HRF provides a generic set of life sciences hardware that researchers can use to conduct human life sciences investigations on board the International Space Station.

The first goal of the HRF is to support the needs of the science community by providing the hardware and the capabilities to collect and distribute data from human life sciences research in space, White said. It is also intended to support NASA's goal of providing meaningful scientific data during the early utilization phase of the ISS. HRF will contribute to the solution of ISS operational issues associated with long duration space flight.

In August 1995, a life sciences hardware workshop was held in Houston with participants from JSC and the international contributors. Requirements and available hardware were compared from each organization. Each agency was asked to propose what they would like to deliver to HRF for early utilization. After setting the basic criteria, the life sciences group at JSC began working out the details with the international contributors.

Over the next months, the JSC group held meetings with the European Space Agency, the French Space Agency, the German Space Agency, the Canadian Space Agency, and the Japanese Space Agency to negotiate a plan that detailed who would be responsible for providing each piece of hardware for the first two racks of the HRF, and to establish a basic schedule for delivery.

At the November 1995 meeting of the International Space Life Sciences Strategic Planning Working Group in Vancouver, Canada, representatives from all the member agencies agreed to begin the process of determining the international life sciences research hardware contributions for HRF. Due to cost and time constraints and the shared interest in life science, they decided that international participation in the creation and delivery of the hardware was the best way to ensure project success. Each agency could bring to the arena its piece of the life science puzzle and contribute its expertise, and in return save money and achieve the benefit of sharing space technology.

Several pieces of hardware were agreed to in principle. ESA was given the responsibility for the Muscle Atrophy Research and Exercise System. This strength measurement device allows scientists to evaluate, in a microgravity environment, the strength of muscle groups associated with the major joints of the human body. ESA also will provide the Hand Grip Dynameter, a hand-held device capable of measuring instantaneous hand strength as a function of time for periods of up to 60 seconds; the Percutaneous Electrical Muscle Stimulator, providing local muscle stimulation in conjunction with measurements of other devices; and the Bone Densitometer, which measures bone density.

France will provide the Head and Body Tracking System designed to monitor, record, and analyze the motion of crew members and to record the performance of experiments during space flight.

Germany's responsibilities include the Lower Body Negative Pressure device which will vacuum seal at the subject's waist and provide an automatic controller to regulate negative pressure applied to the subject's lower torso. In the past, LBNP has allowed scientists to investigate deconditioning of the human cardiovascular system due to long periods of weightlessness.

Germany also will provide the 3-D Eye Tracking System which is a lightweight, head-mounted video camera system capable of measuring and recording eye movements and simultaneous head motion during various vestibular experiments.

The JSC group had to overcome a few minor hurdles to accomplish its mission. Language, cultural, and even time-zone differences were small obstacles to the success of their project. Ultimately, it was a well-balanced combination of the old and new style of communications that proved most successful as face-to-face meetings, fax and e-mail solved many problems. Yvonne Tomaro, Lockheed-Martin Engineering Services International Coordinator for HRF, became the center of communications for the project.

"I'd come in early in the morning with a list of phone calls to make and information to pass on before the international partners went home for the day," she said. "When the Japanese Space Agency joined the mix, even getting in early didn't help. The time difference was just too much. That's when I really had to rely on e-mail and faxes."

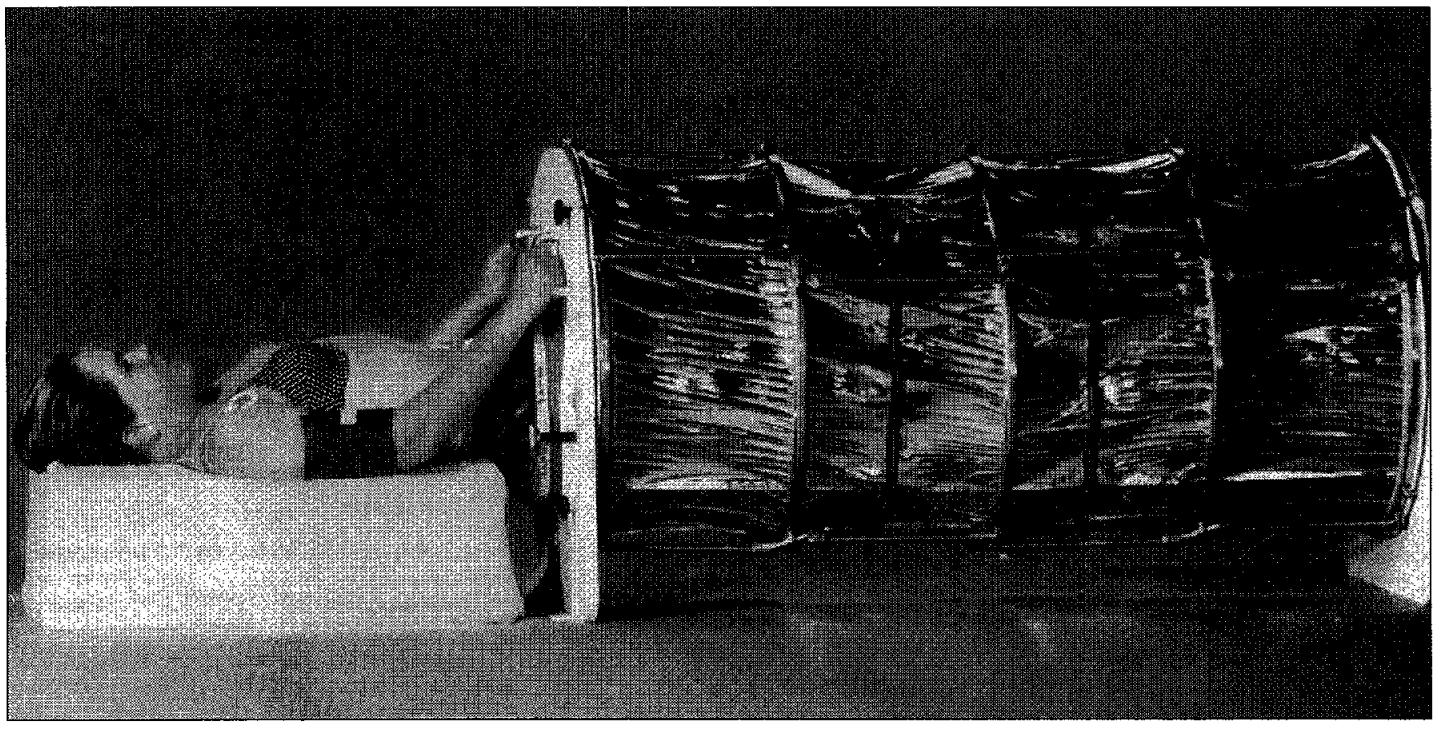
On April 12, after a few swift months of negotiations, a significant international first for station life sciences was accomplished in Frascati, Italy, when representatives from all the member agencies agreed to an international approach to science recruitment, review and selection. The first international coordinated research announcement will be released in December of this year. Internationally coordinated research announcements will be released annually.

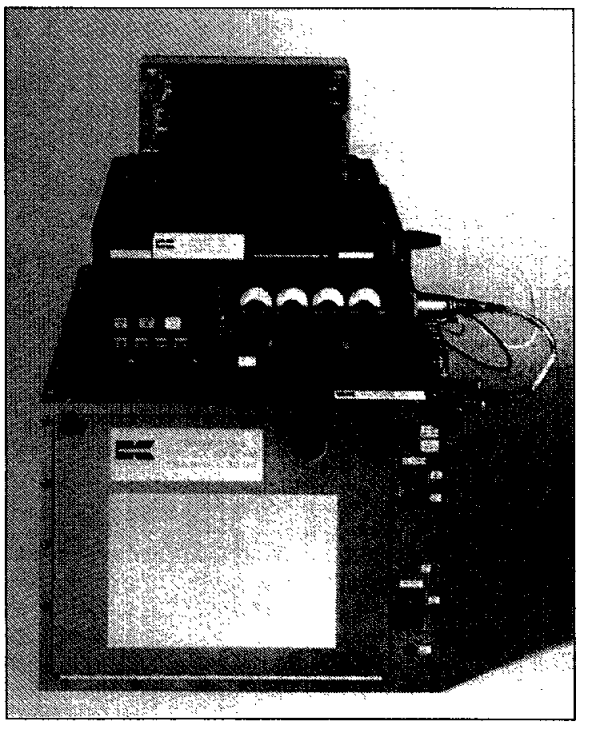
A top-level protocol was drafted and signed by the directors of life sciences from NASA, and the French and German space agencies. It was agreed that other international life science organizations will contribute human life science equipment to be included as an integral part of the NASA HRF racks 1 and 2 to be flown as early life science utilization on the ISS.

"The station started [international cooperative agreements] at the program level, it was implemented with training and operations, now we're going to do it at the science level," White said.

With this first step toward international cooperation in the area of life sciences, the scientific community has begun a steady march toward space station research. Following the initial agreements, Equipment Contribution Plans were prepared for each agency. These agreements define the roles and responsibilities of each agency and how the equipment will be configured, used, and maintained. They also identify the documentation required, along with other support required by each agency. An approach for the contribution of hardware for HRF racks 1 and 2 was agreed to and accepted by the group. Members of the life sciences community are proceeding to finalize the processes required to implement these agreements.

These agreements, based on mutual respect and mutual necessity, are a clear sign of the future for scientific space research, White said. This protocol, together with hardware sharing and contribution protocols and plans, represent how life sciences research will be carried out on the ISS and beyond. For the first time, multination agencies have agreed to share their individual technology and resources for the benefit of the entire scientific community. ❑





Seatbelts save life of JSC's Quality director

By Rindy Carmichael

After being involved in a head-on collision on NASA Road 1 in Webster, Safety, Reliability, and Quality Assurance Director Charlie Harlan describes seatbelts as an "elegant" element of the automobile.

"A seatbelt saved me from very serious injury or even worse, in an accident a few years ago," Harlan said. "Fortunately for me, I have always believed in seatbelts and make a habit of checking that my seatbelt is properly secured and cinched down tight. This incident proved to me the seatbelt's value."

Harlan remembers driving his full-sized van east on NASA Road 1 on a Saturday afternoon, traveling with the flow of traffic at about 35 mph. "I was struck head-on by a full-sized pickup truck. The truck had been hit by another car, forcing it into my lane. I had no time to stop or move out of the way. I estimated the truck to be going the same speed as I was—it was like hitting a brick wall at 70 mph. I had a good firm grip, with both hands, on the steering wheel. The force from my body's impact bent the steering wheel and broke my watch band; my glasses flew off and I broke my nose—but I was still fastened securely to the seat."

Harlan describes the driver of the pickup truck as being surprised. "He had a young boy with him. Both were buckled up tight and neither one suffered an injury." The man apologized for hitting me and told me if we hadn't been wearing our seatbelts, we would have gone through the windshield. I agreed.

"Both cars were totaled, but I suffered relatively minor injuries for that serious of a crash," continued Harlan. "That's the payoff for being diligent every time you get in the car. You can't determine when you'll be involved in an accident. Everything can change in a fraction of a second, with no control over the incident."

Harlan emphasizes that motorists should fasten their seatbelts securely in place, both chest and lap belts, and keep them in good shape. The payoff for such a simple procedure can be a life.

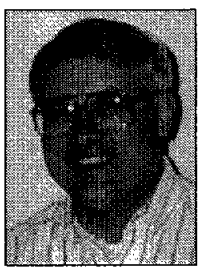
"An automobile's seatbelt is one of the most elegant safety controls ever devised by mankind," Harlan concluded. "There is no doubt of their effect in reducing or preventing injury in a serious vehicle crash. They are very inexpensive for what you get in return."

To learn more about seatbelt safety, employees are invited to visit the Motor Vehicle Safety Exhibition from noon-3:00 p.m. Wednesday in Teague Auditorium. The Pasadena Police Department's "Convincer" which simulates a crash at seven mph will be on hand as well as information on motorcycle, child restraint and on-site traffic safety. Trooper Steve Hargett, 1995 Safety Awareness Day speaker, will talk at 1:30 and Precinct 8 Constable's Office will provide their static DWI exhibit. For more information on the program, contact Rindy Carmichael at x45078.

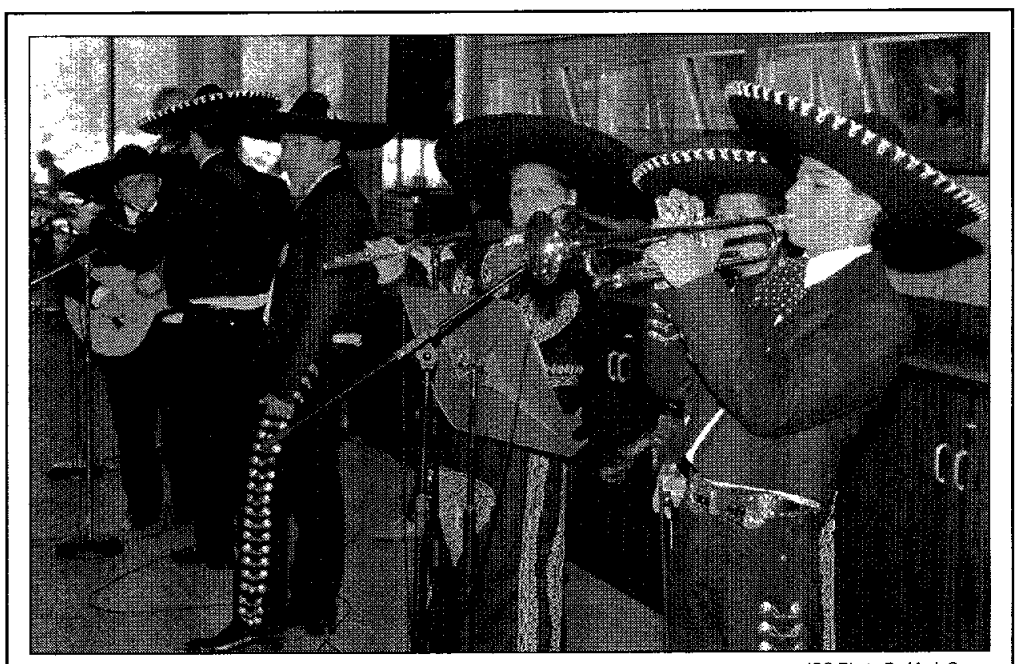
Memorial set up for Lunde

The May 17 issue of the Space News Roundup included a photo that was incorrectly identified as Al Lunde of the Mission Operations Directorate's Flight Design and Dynamics Division.

Lunde died May 9, from apparent complications of heart disease. Lunde, who came to the U.S. from Norway in 1957, joined NASA in 1966 in the Mission Planning and Analysis Branch. He worked on all of the human space flight programs from Gemini through the International Space Station, developing mission support requirements and development. His most recent work was in mitigating the effects of orbital debris. A memorial has been established in his name with the American Heart Association.



Lunde



JSC Photo By Mark Sowa

CINCO DE MAYO—Edison Middle School "Mariachis" entertain JSC employees during a Cinco de Mayo celebration this month in the Bldg. 3 cafeteria.

Science fiction, fact symposium set for next week

JSC employees are invited to a science fiction and science fact symposium to be held from 12.30-2 p.m. next Friday in Teague Auditorium.

The symposium sponsored by Author Services Inc. is the finale for a week-long workshop for winners of the "L. Ron Hubbard's Writers of the Future" contest.

The symposium's focus is on humans living and working in space and will feature science fiction writers and JSC employees.

Panelists include writers Jerry Pournelle, Frederick Pohl, Larry Niven and Algis Budrys, and Yogi Kondo of Goddard Spaceflight Center. JSC panelists include Astronaut Janice Voss, Kyle Fairchild of the Technology Transfer and Commercialization Office and Don Henninger of the Crew and Thermal Systems Division.

Employees are invited to attend as workloads permit. For more information, call Juanie Campbell at x38613.

Astronauts to be honored with trees Thursday

JSC will honor astronauts who have died with a tree planting ceremony at 11 a.m. Thursday.

The trees will be planted adjacent to Bldg. 111 on Fifth Street. Seven trees were planted in January during the *Challenger* memorial in honor of the STS-51L crew members.

The families of these astronauts, former astronauts and JSC employees are invited to attend the ceremony. There will be a brief dedication followed by a ceremonial planting of the trees by JSC Director George Abbey, Associate Director John Young and astronaut family members.

Volunteers, exhibits still needed for American Heritage Day activities

Volunteers are still needed for JSC's American Heritage Day celebration set for June 10-14.

This year's theme, "A Patchwork of Cultures and Diversity," will be highlighted daily with entertainment, exhibits and displays in the Bldg. 3 cafeteria. The grand finale of the week's activities will be at 3 p.m. June 14, with a variety of performers and food vendors representing many ethnic cultures.

In order to accomplish this event, volunteers are needed for a variety of tasks. Volunteers are needed to serve on the planning subcommittees, as well as to participate in the activities including food pick-up from local eateries, food servers, "town criers" to help announce daily events, greeters and clean-up. Employees interested in helping in any of these areas can call Bridget Broussard-Guidry at x34834.

In addition, employee exhibits and displays are needed. These exhibits are to depict employees' cultural diversity of hobbies, creations collections and other interests. Employees interested in exhibits can call Elaine Kemp at x30556.

New exhibits to highlight open house

(Continued from Page 1)

in both cafeterias.

New exhibits and demonstrations will include an Apollo service module oxygen tank like the one which ruptured during Apollo 13, a "closed-loop" life support test bed and hourly demonstrations of both U.S. and Russian space suits.

More hands-on activities are also planned. Visitors will have the opportunity to try their hands at either landing the shuttle or docking it to the International Space Station in the Bldg. 16 system simulators. In Bldg. 9, besides getting a look at the shuttle and space station mockups, they will have the opportunity to try out the Air-Bearing Floor.

At Ellington, four NASA planes will be on display—a T-38, WB-57F, the Shuttle Training Aircraft and the KC-135. The T-38 ground egress trainer will also be available for family photo opportunities.

"Hosting an open house of this size requires a lot of work," Fluegel said. "Fortunately, we have an enthusiastic group of people doing the job."

Open House committee members are Debbie Denton-Misfeldt, AH; Teresa Sullivan, AH12; John Cools, AI; Lupita Armendariz, AJ; Billie Deason, AP; Brenda Sturman and Dale Martin, PA; Margie Keller, Larry Neu and Mary Lee Meider, CA; Tom Diegelman, DA/TA; Al Behrend, EA; Sandy Griffin, HA; Ginger Gibson, JA; Cathey Lamb, LA; Kitty Rogers, MA; Jeff Evans, NA; Renee' Julian, OA; Rachel Windham, SA; Mary Chesler, XA; and Lindy Fortenberry, YA.

Volunteers from all organizations will be needed to work exhibits as well as assist and provide information to visitors around the center. Those interested in helping should contact Sandy Griffin at x31056.

"We heard from many of the volunteers last year who received extremely positive feedback from the Open House visitors," Fluegel said. "I think everyone who helped last year went home with a good feeling about working here. The community is really behind JSC and the space program."

Columbia rolls to pad Thursday for June launch

(Continued from Page 1)

used less propellant than expected and mission managers were confident that there are enough consumables to support the full 10-day mission. Mission Specialist Marc Garneau used the robot arm to grapple Spartan Tuesday after a smooth rendezvous by Casper and Brown.

Throughout the mission work has continued in the Spacehab module. Nearly 3,000 pounds of experiments and equipment are supporting a variety of activities that will keep the crew busy during the mission which is scheduled to conclude Wednesday with a landing at Kennedy Space Center.

Meanwhile, work continues to ready *Columbia* for its late June mission on STS-78. The orbiter was transferred to the Vehicle Assembly Bldg. this week where it will be mated to its solid rocket boosters and external tank. After interface verification testing, *Columbia* will roll out to Launch Pad 39 B.

The STS-78 crew — Commander Tom Henricks, Pilot Kevin Kregel, Mission Specialists Susan Helms, Rich Linnehan and Charlie Brady, and Payload Specialists Jean-Jacques Favier, and Brent Thirsk — will head for Kennedy Space Center the first week of June for the Terminal Countdown Demonstration Test. STS-78 is a two-week Life and Microgravity Spacelab mission scheduled to launch June 20.

Registration for on site courses soon

JSC employees may obtain registration information this month for graduate engineering courses to be held on-site and at University of Houston.

In cooperation with the Cullen School of Engineering at the University of Houston, JSC will again be offering a graduate engineering course on-site via satellite for the Fall 1996 term. As a convenience to JSC employees and contractors, information regarding registration for UH engineering courses will be held from 10:30 a.m.-2 p.m. July 1 in the lobby of Bldg. 45.

Registration forms for UH are available in the Human Resources Development Branch, Bldg. 45, Rm. 146. JSC employees may submit a completed Form 75 as payment for their engineering courses. Contractor employees will receive an invoice from UH. A representative from UH Cullen College of Engineering will be on hand to advise students for all engineering classes and accept applications from new students.

All applicants for admissions and all new students must bring their undergraduate transcript with the degree posted and a $25 non-refundable application fee. All new students should keep in mind that only six hours taken as a post-baccalaureate student may be transferred to graduate credit.

Employees can register for all engineering courses through the voice information processing system and are billed directly. Civil servants can return their approved JSC Form 75 as payment. A complete summer and fall schedule is available Bldg. 45, Room 146.

The Human Resources Development Branch will offer UH Cullen College of Engineering graduate courses on-site via satellite and at UHCL with UH professors. Summer classes include Logistics Engineering I and Occupational Safety Engineering.

Fall classes include Computer Networks; Advanced Microprocessor Systems; Computer Design and Architecture; Statistical Decision Analysis and Design; and Computer-Aided Manufacturing.

One summer class—Forecasting Applications in Engineering Planning—will be available at the University of Houston Clear Lake. Fall classes that will be offered at UHCL are Operations Research: Digital Simulation; Industrial Ergonomics; Mechanics of Composites; and Conduction/Radiation.

If you have any questions or would like additional information, please contact Kazuko Hall at x33075.

STS-81 crew trains in Russia

(Continued from Page 1)

Isolation Mount, a platform developed by the Canadian Space Agency to isolate various experiments from the perturbations that occur on-board the station. It is important to many of the science experiments such as crystal growth to have a good microgravity environment.

"We do have a good microgravity environment here but there are a lot of changes to it at various times due to crew activities and thruster firings, etc.," Lucid said.

This facility can isolate an experiment from external forces, or generate controlled forces for broader and cleaner experiment results.

With the hectic schedule of space research being conducted on Mir, there has been little time for the crew to become bored. Lucid spends any available free time observing the Earth. She says that she misses her family and friends back home, but she knows that when she returns she will also miss being on-board the Mir.

When asked by a German news reporter what she planned to do when her mission was completed Lucid said. "When I get back to Earth, I'm going to go into my house. I'm going to sit in a big chair. I'm just going to listen to everyone tell me what they've been doing for the past so many months I've been gone." Lucid is scheduled to be replaced in early August by astronaut John Blaha, ending a more than 140-day stay in space.

Today marks 62 days in orbit for Lucid and 91 for Onufrienko and Usachev.

Meanwhile, at the Gagarin Cosmonaut Training Center in Star City, Russia, the STS-81 astronauts arrived for four days of training with Blaha and backup Jerry Linenger. The crew attended classes on construction and components of Mir and the life support and communication systems of the Russian outpost. They crew also talked with their Mir 22 counterparts about docking and transfer procedures.

NASA-JSC