



# Space News Roundup

Vol. 31

July 24, 1992

No. 29

## Cohen confident station will prevail

*Andrews predicts Freedom funding victory in Congress*

NASA Acting Deputy Administrator Aaron Cohen and Rep. Mike Andrews told a Spaceweek '92 banquet audience Monday night they are confident Space Station *Freedom* will prevail in congressional funding decisions this year.

The House is scheduled to vote Tuesday, for the third time in 14 months, on whether to fund the space station or terminate the program, Cohen said, but discussions between NASA Administrator Daniel Goldin and both Democratic and Republican leaders have paved the way for a favorable vote.

"We're confident the space station will ultimately prevail, but it is going to be a very tough struggle," Cohen said.

Andrews, D-Houston, said the space station's supporters expect to win this year's debate on funding, and that Houston will ultimately play a big part in the station's construction.

"On both sides of the aisle, the leaders of the House understand the critical importance of the station and they are supportive," Cohen said. "Goldin has made the point that *Freedom* is a core element of the agency's mission and that it is essential to the continued vitality of the manned space program."

Cohen said the agency's leaders realize that NASA's budget will be constrained, but have told congressional leaders that if the nation's civil space and aeronautics pro-

gram budgets are constrained, the agency must be given flexibility to determine program content.

"So the message is, 'O.K., if you're going to reduce the budget, we can handle that, but let us have a greater say in deciding how to spend it,'" Cohen said.

Cohen said two renewed partnerships that came to fruition this week — between NASA and Russia and NASA and the National Institutes of Health — offer an era of great opportunity. The Russian agreements will involve American astronauts visiting the Mir space station, Russian cosmonauts flying on the space shuttle in 1993, and a shuttle-Mir docking a year or two

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JSC Photo by Robert Markowitz  
Partiers gather at the eighth annual Spaceweek National Banquet before the keynote speeches by NASA Acting Deputy Administrator Aaron Cohen and U.S. Rep. Mike Andrews. The banquet was one of the highlights of the week-long international space forum.



JSC Photo by Bob Walck

**RAPID RESPONSE**—JSC, the City of Houston and the Air National Guard put their emergency preparedness to a test during the annual aircraft mishap simulation to exercise the emergency network's response. Members of the Ellington Crash and Rescue team provided medical care to six individuals with fake injuries resulting from a simulated Gulfstream II engine explosion and fire last week. Robert Janney received care for simulated injuries that occurred when he was hit by an aircraft tug as part of the exercise. If Janney's injuries had been real, he would have been taken by helicopter to an area medical facility.

## Co-op Program to celebrate 30 years at JSC

By Audrey Schwartz

Many of the talented minds that have helped NASA to land humans on the Moon, to design a reusable space shuttle and plan Mars voyages have belonged to college sophomores, juniors and seniors.

Next week, a 30th anniversary reunion of all current and former co-ops, supervisors and friends will recognize their accomplishment. The

Co-op 30th Anniversary Reunion will be held from 5-8 p.m. July 31 at the Gilruth Center.

A program reviewing co-op program accomplishments, a comparison of co-op life then and now, and reminiscences of co-op coordinators will begin at 6 p.m. The deadline to RSVP is Monday.

Since 1962, the cooperative education program has been a source of

enthusiastic, high-quality young college students for the JSC workforce. Nearly one-fifth of the current JSC employees were hired through the JSC or Manned Spacecraft Center's co-op program.

"Students want to work at NASA, and particularly JSC," said JSC Co-op Coordinator Jack Kochner. "They are excited and eager about the

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## Hilmers leaving to study medicine

By Barbara Schwartz

Astronaut Dave Hilmers is leaving NASA in the fall and retiring from the U.S. Marine Corps to pursue a medical degree at the Baylor College of Medicine in Houston.

Hilmers, a colonel, has flown on four space shuttle missions, logging more than 493 hours in space. In September 1988, he served as a mission specialist on STS-26, the first flight after the *Challenger* accident, which deployed a Tracking and Data Relay Satellite.

More recently, Hilmers was a crew member on the STS-42 International Microgravity Laboratory-1 mission in January, working on experiments in

a broad spectrum of scientific disciplines provided by investigators from 11 countries. Two of the missions, STS-51J in October 1985 and STS-36 in February 1990, were Department of Defense flights.

"As I leave NASA, I reflect on 12 years filled with grand experiences, great joy and occasional sorrow," Hilmers said. "Above all else, I will miss my co-workers in the space program who stood by me throughout, and whose efforts were responsible for anything I might have achieved."

Selected as an astronaut in 1980, Hilmers has served in a number of technical assignments, including

work on upper stage vehicles, shuttle software verification, astronaut office training coordinator, spacecraft communicator, Space Station *Freedom* issues and head of the Mission Development Branch within the Astronaut Office.

"At this time, I feel that I have been assigned to a new mission in the field of medicine and my hope is that my service to others would someday approach the support I have enjoyed here," he added.

"Dave is a brilliant and totally unselfish person," said Flight Crew Operations Director Don Puddy. "I'm sure he will be successful in his new career as a doctor."

## NASA, Russia confirm details of cooperation

Following a seven-day trip to Russia and the Ukraine, NASA Administrator Daniel Goldin on Tuesday announced plans for the United States and Russia to implement last month's agreements by Presidents Bush and Yeltsin.

Goldin said significant progress was made in developing a plan to carry out a wide range of projects, including expansion of cooperation in life sciences and global change research, the exchange of an American astronaut and Russian cosmonaut, and a space shuttle rendezvous and docking with the Russian Mir space station.

"In our relationship with Russia, we need to start slowly and deliberately to build a strong foundation of cooperation," Goldin said. "In this way we will ensure that what we do together will be successful, both technically and scientifically."

Goldin said much had been learned on the interagency trip, jointly led by National Space Council Executive Secretary Brian Dailey, and which was agreed upon by Vice President Quayle and President Yeltsin in a meeting last month. The delegation included Assistant Secretary of the Air Force Martin Faga and representatives from the National Security Council, State Department and the Central Intelligence Agency.

"The delegation had the opportunity to take a closer look at Soyuz-TM, the Russian docking system and at their human space flight operation," Goldin

said. "We also learned a lot about the capabilities of the Mir space station and discussed ways to expand critical life science research and global change research."

Goldin said both the United States and Russia agreed to encourage private companies to expand their search for new commercial space business and agreed to facilitate appropriate contacts. Both countries also agreed that the docking mission planned in 1994 with Russia would highlight biomedical science.

NASA and the Russian Space Agency agreed — pending an appropriate review and approval of the governments of the two countries — to continue the activities now under way by the five working groups established under the 1987 joint agreement with the Russian Academy of Sciences. Additional initiatives will be undertaken by the Working Group of Space Biology and Medicine which will now look at life support systems.

The officials also agreed to:

- study the possible use of Mir for long lead-time life sciences research;
- establish a new working group to develop a plan to enhance cooperation on global change research (Mission to Planet Earth);
- recommend cooperative biomedical research projects for future missions, including the missions involving the exchange of a Russian cosmonaut and an American astronaut and the space shuttle/Mir rendezvous and docking mission;



Dave Hilmers

## Goldin denounces reports of coming force reductions

NASA Administrator Daniel Goldin emphatically denied reports Wednesday of impending high-level reductions in force at NASA Headquarters.

The news article, which claimed NASA planned to reduce its Headquarters staff by 500 on Aug. 1 is "completely false," Goldin said.

He said he believes the inaccurate report may have originated from proposed legislation to reduce the agency's research and program management funding for fiscal

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# 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. For more information, call x35350 or x30990.

Ringling Bros. Barnum Bailey Circus (11 a.m. Aug. 1, Summit): \$8, limit six tickets  
Metro passes, books, tickets available throughout July.  
Fiesta Texas Park (San Antonio): adult, \$19.50; child 4-11, \$13.55.  
Sea World (San Antonio): adult, \$18.90 (child free with paying adult); child 3-11 \$13.55.  
Astroworld, \$16.95 and \$14.95 (child under 54 inches), \$44.95 (season pass) and Waterworld, \$9.50.  
Six Flags, \$16.95 (one-day) and \$22.95 (two-day).  
Movie discounts: General Cinema, \$4; AMC Theater, \$3.75; Loews Theater, \$4.  
Stamps, Walt Disney Club memberships also available.

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# 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.

**EAA badges** — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

**Weight Safety** — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. July 28. Cost is \$5.

**Defensive driving** — Course is offered from 8 a.m.-5 p.m. Aug. 1. Cost is \$19.

**Aerobics** — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

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

**Aikido** — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is \$15 per month.

**Volleyball sign-ups** — Registration for summer volleyball leagues will be July 27-28.

**Basketball sign-ups** — Registration for summer basketball leagues will be July 29-30.

**Scuba** — Scuba lessons will be offered at 6:30 p.m. Tuesdays and Thursdays beginning July 30. Cost is \$190 plus \$20 for the open water dive trip. Personal equipment needed runs about \$90.

**Tennis** — Beginner lessons will be from 5:15-6:45 p.m. Mondays beginning July 20. Beginner-advanced classes will be from 5:15-6:45 p.m. Wednesdays beginning July 22.

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

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

## Property

Rent: Santa Fe, 3-2 mobil home, carport, lg yard, \$300/mo, \$300 dep. 326-1159.  
Sale: Lake Livingston cabin, sleeps 4-5, elec, AC, lake view, 80 sq ft, \$7.9K. Rich, x36900 or 332-7399.  
Lease: Pipers Meadow, 3-2-2, carpet, drapes, FPL, fenced, built-ins. 538-3352.  
Sale: Bacliff, 2-story, 2 or 3 BR, 2 bath, 10% dn, owner finance, \$39K. Terry, x37727 or 481-5659.  
Sale: Matagorda Bay, 1 BR, furn, encl garage, on the water. Ms. Pat Christinson, 512-972-2940.  
Lease: League City, The Landing, 3-1-1, miniblinds, fenced, \$600/mo + dep, no pets. 486-9811.  
Rent: Vacation timeshare condo, any destination of choice, \$300 for one wk, to be used by Dec 31. Katie, x33185.  
Lease: El Dorado Trace condo, lg 1 BR, 2 balconies, all appls, full sz W/D, alarm sys, ceiling fan, miniblinds, no pets, \$435/mo. + dep. Mark, x30131 or 488-0056.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, W/MD. Magdi Yassa, 333-4760 or 486-0788.  
Sale: 71 acre ranch, LaMoca Hwy 83 Webb County, deer blinds, deer feeders, 2 BR house, water well, elec pwr, mineral rights, \$120K. 326-1833.  
Lease/Sale: Nassau Bay TH, 4-2-2 remodeled, master dn, 2-story LR, \$1190/mo., 1-3 yr lease, or \$119.9K. Jerry, x38922 or 488-5307.

## Cars & Trucks

'90 27' Class C Mallard motorhome, 2.5 yr ext warr, sleeps 6, self-contained, ex cond, \$29K. 488-6733.  
'91 Camaro RS, red, 5.0, auto, all pwr, alarm, \$12.5K. Tim, 324-3840.  
'88 Nissan Sentra E, 2 DR, 5 spd, AC, AM/FM, 70K mi, new tires, slight body damage, \$4100 OBO. Walt, x35939.  
'91 Camaro RS, white, auto, AC, stereo cass. 487-2383.  
'79 Dodge PU, AC, new rear end, \$1K. 334-6901.  
'84 Chevy C-10 Full Bed PU, bedliner, new carb, converter/muffler, AM/FM/cass, 4 speakers, 76K mi, \$3.2K. Jim, 335-2539 or 474-2368.  
'80 Chevy Chevette, 4 spd, 75K mi, runs good, \$675. 283-1834 or 332-4807.  
'85 Chevy F150, 100K mi, custom seats, new tires, running boards, camper top, ext cab, ex cond, \$4.8K. 339-1152.  
'66 Chevy PU, restored, V8, auto, AC, AM/FM, 70K mi, \$5,250. 474-7425.  
'82 Jeep CJ7, AC, new fabric top, good cond, \$2.9K. x33291 or 481-9523.  
'85 Toyota MR2, ex cond, 80K mi, 5 spd, load-

ed, \$4,850. 538-1479.

'87 Suzuki Samurai, 71K mi, \$3K. 486-0638.

'71 Pontiac Lemans Sport, PS, PB, AC, 45K mi, \$6.3K. Tom, 333-6592.

'91 Toyota PU Xcab DLX, 35k mi., alarm, ex cond, take up pymts. Don, 472-1042.

'87 Dodge Aries, 4 DR, 47K mi, new brakes, \$2.1K OBO. Mike, x31539.

'79 Formula Firebird, compl front end, doors, parts; '77 Camaro front end, rear bumper for Chevy PU, no driveline parts for any. 339-2198.

'88 Mazda MX6, silver/blue int, ex cond, \$6,495. 488-9020 or 286-5945.

'91 Toyota Previa LE van, 14K mi, wht, lgt grey int, ex cond. Dennis, x39012 or 992-5285.

'84 Volvo GL turbo, 4 DR, sienna brw, tan leather int, 1 owner, good cond, \$4.5K. 482-8224 or 333-7761.

'88 Dodge Grand Caravan, 6 cyl, AM/FM, luggage rack, 75K mi, \$7.9K or trade for full sz 3/4 ton van. Tony, x30028 or 486-5707.

'90 Mitsubishi Galant LS, auto, AC, cruise, PW/PB/PS, AM/FM/cass, warr, 29.9K, \$11,500 OBO. Karrie, 484-9233.

'79 Chrysler, 4 dr, new eng, trans 90% restored, new paint, \$1,995. Jim, x32121 or 489-1235.

'77 Grand Prix, new eng, radiator, batt, alternator, starter, master cylinder, 2 yr transmission, ex cond, \$1K OBO. David, 554-5514 or 282-3827.

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# Dates & Data

## Today

**RICEE deadline** — The deadline for applications to participate in the Rice Institute for Continuing Education in Engineering program is July 24. Interested employees should contact Laura Goerner at x33067.

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

## Monday

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

## Tuesday

**BMC meets** — The Bendix Field Engineering Corp. Management Club will meet at 5 p.m. July 28 at the Gilruth Center. Gwen Griffin will provide "A Look Inside Space Center Houston." For more information, call 282-3462.

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

## Wednesday

**Lunch and learn** — The American Institute of Aeronautics and Astronautics Materials, Structures and Dynamics Committee will host a

lunch and learn meeting on Space Station *Freedom* Plume Impingement at 11:30 a.m. July 29 in Lockheed Plaza I, Conference Rm. 12C. Reza Aghilli, James Fahling, Dave Francis and Bill O'Herren will summarize the loads and dynamics analysis used to minimize shuttle plume impingement effects on the station. For more information, call Jim Myers, 333-7635.

**Toastmasters meet** — The Spaceland Toastmasters Club will meet at 7:15 a.m. July 29 in the Bldg. 3 cafeteria. For more information, call Darrell Boyd at x36803.

**Astronomy seminar** — JSC Astronomy Seminar will be held from noon to 1 p.m. July 29 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

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

## Thursday

**Cafeteria menu** — Special: smothered steak with dressing. Entrees: chicken and dumplings, corned beef with cabbage. Soup: beef and barley. Vegetables: spinach, cabbage, cauliflower au gratin, parsley potatoes.

## July 31

**Co-op reunion** — A reunion honoring the 30th anniversary of the cooperative education program at JSC will be held at 5 p.m. July 31

at the Gilruth Center. All current and former NASA co-ops, their supervisors and friends are invited. Tickets, which may be purchased in Bldg. 11 during lunch hours July 20-24, are \$5. For more information, call x32697.

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

## Aug. 4

**SOAR '92** — JSC will host the 1992 Space Operations, Applications and Research Symposium Aug. 4-6 at the Gilruth Center. Co-sponsored by JSC and the Air Force Material Command, the symposium will include program overviews, panel session, exhibits and technical papers on robotics and telepresence, automation and intelligent systems, human factors, life support and space maintenance and servicing. For registration information call 282-2223; for exhibits information, call Chris Ortiz, x31904.

## Aug. 5

**Astronomy Seminar** — The Astronomy Video Tape Series continues during the weekly JSC Astronomy Seminars. "Old Supernova" with Dr. Roger Chevalier will be shown at noon Aug. 5 in Bldg. 31, Room 129. For more information, contact Al Jackson at 333-7679.

# Swap Shop

monitor minus pwr supply/case, \$10;

Commodore 64, junk C64 for parts, \$25; Kazpro II-83, \$200; Sinclair ZX-81 plus 64K RAM, \$30; PCXT keyboard, \$10. Jesse, 332-6681 or 332-8869.

Realistic 80W + 80W car amp, good cond, \$75. 337-5853.

Sega Master sys w/2 control pads, light phaser, 5 game cartridges, \$125. Laurie, x35590 or 991-0821.

Brothers #3400 word processor, 1 yr old, keyboard, monitor, 3.5 disk, spreadsheet capable, \$300 OBO. 996-0377.

Tatung CGA color monitor, ex cond, \$250 OBO; Panasonic 1180 dot matrix printer, ex cond, \$150 OBO. Lisa, 283-7536 or Pat, 474-4006.

IBM compatible XT, 40 MB, math coprocessor, Hercules graphics, 640K, FD, \$400. 334-4894.

Borland Paradox 3.5 database, \$125 OBO; Quattro Pro 3.0 spreadsheet, \$75 OBO; Central Point Anti-Virus, \$30 OBO; all complete w/manuals and registration cards. Martin, x45338 or 488-0949.

'88 Dodge Grand Caravan, 6 cyl, AM/FM, luggage rack, 75K mi, \$7.9K or trade for full sz 3/4 ton van. Tony, x30028 or 486-5707.

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Twin brwn sofas, steam cleaned, \$300 OBO for set; dining room table, 3 chairs, \$160. x36135 or 480-7196.

2 Queen sz waterbeds, 6 drawers, life time warranty on mattress and heater, good cond, \$200/ea. 585-4657.

Living room set, sofa, chair, ottoman, coffee table, end table, 2 lamps, \$250 OBO; dog pen 6x3x6, \$50. x33814 or 486-9760.

Twin 4 poster/canopy bed, maple oak, 2 Sealy interspring extra firm mattress, rails, deck, ex cond, \$175. 331-0616.

'79 club car golf cart, wht w/top, new tires, brakes, switches, relays, seat pan, motor brushes, complete w/charger, \$500. Chuck, x49866 or 334-3430.

Colt government, .380, stainless, never fired, \$335. 333-6592.

10' screened lawn canopy, \$85; dining table w/4 chairs, leaf, walnut Danish design, \$200; Hoosier cabinet, 1930's Flour bin, meat grinder, oak, roll front, metal work surface, cutting board, \$300. 339-1152.

Sears elec daisy wheel typewriter, 100 character print wheel, 64 character correction memory, programmable tabulator, 5 yrs old, \$75. 280-2228 or 479-6126.

Woman's 14K gold/diamond engagement ring, wedding band, sz 5.25, \$1500; Man's 14K gold/diamond wedding band, sz 9, \$750. Nancy, x37106 or 332-5219.

Set of Spacshots Series II, incl 3-D embossed "Moon Mars" card. Andrew, 280-0647.

# Testing the Waters

## Three missions in one, STS-46 'toe in the water' for tether operations

By Kari Fluegel

Throughout the first 12 years of the Space Shuttle Program, the words "the most complex flight to date" have been applied to numerous missions as shuttle and flight control team capabilities are expanded and tested.

But when *Atlantis* launches next week STS-46 will have undisputed claim to the title — for now.

"STS-46 is really three flights in one," said Lead Flight Director Chuck Shaw.

The payload complement includes the European Retrievable Carrier, also known as EURECA-1, the Tethered Satellite System-1 and several secondary payloads, one of which requires the shuttle to remain in a single payload bay forward attitude for 40 hours.

TSS-1 probably will be the focus of attention during STS-46, but EURECA-1 also issues in a new era in space operations.

The EURECA-1 platform, which contains a series of experiments dealing with materials sciences, life sciences and radiobiology, will remain in orbit for about nine months before being retrieved during a later shuttle mission.

"EURECA, if it were on any other flight, would be the center attraction," Shaw said. "It's a major payload in and of itself."

Flight controllers here will be working with satellite controllers in Darmstadt, Germany, during the deployment station-keeping operations that fill the first 18 hours of the mission. Once EURECA is on its way, TSS-1 will take center stage.

TSS consists of a satellite attached to the orbiter by a super strong cord that will be reeled into space from the cargo bay to demonstrate the feasibility of the technology for a variety of uses ranging from generating electrical power to researching the upper atmosphere.

"This 30 hours is the best look into the future that I have seen in a long time," Shaw said.

For STS-46, the tether — which looks like a 12-mile-long white boot lace — has electrically conducting metal strands in its core that will generate electrical currents at a high voltage using the same basic principle as a standard electrical generator — by converting mechanical energy (the shuttle's more than 17,000-mile-an-hour orbital motion) into electrical energy by passing a conductor (the tether) through a magnetic field

(in this case, the Earth's magnetic field lines).

"We had to invent an entire new body of knowledge from zero for TSS," Shaw said.

In the Gemini program, rudimentary research on tethered spacecraft was looked at simple solutions to station keeping, but that work was only "a toe in the water" of knowledge needed for TSS-1.

In comparison, the effort massed for the first shuttle rendezvous and proximity operations was substantial, and planners had information from the Gemini and Apollo programs on which to base their theories and calculations.

For STS-46, theories on tether dynamics had to be incorporated with shuttle safety requirements. New methods of flying the orbiter while towing a satellite also had to be designed.

All of this was done with limited resources, Shaw said.

The tether dynamics work is being managed by guidance and procedures officers John Malarkey, Chris Meyer and Lynda Gavin. The payload officers — Jeff Hanley, Nellie Carr, Tim Baum and Sherry Molnar — are coordinating operation of the hardware systems.

"The TSS body of knowledge is equal to or bigger than that for rendezvous and prox ops," Shaw said.

That body of knowledge will be managed from the Mission Control Center. Because of the necessary intertwining of the satellite operations and science operations, payload controllers and investigators from Marshall Space Flight Center will gather in Houston. About 90 payload controllers for each shift are needed for TSS-1 operations and will be in Bldg. 30 with the flight control team.

Shaw said the management of STS-46 and TSS-1 is much like that of a Spacelab mission.

"For a Spacelab flight the orbiter team operates the orbiter and provides an environment for the science community to go do their scientific investigations," he said. "That's exactly what we're doing with the tether. It just so happens that our laboratory is 12 miles long."

STS-46 also will initiate the mandatory use of work stations for flight controllers. Such user-friendly computer systems have been employed in the MCC for several missions, but for STS-46 they will be put to the operational test, Shaw said.

"Mission safety for STS-46 does not rely on workstations," he said. "The safety functions are still in the Mission Operations Computer and on board in crew procedures, but mission success, for tethered operations at least, relies wholly on workstations."

TSS-1 operations will start with a 26-hour on-orbit checkout. The satellite then will be deployed from *Atlantis* when the cargo bay is facing away from Earth, with the tail slanted upward and nose

pitched down. A 39-foot long boom, with TSS-1 at its end, will be raised out of the cargo bay to provide clearance between the satellite and shuttle during deploy and retrieval operations. Orbital dynamics will result in the satellite initially being deployed upward but about

40 degrees behind the orbiter's path.

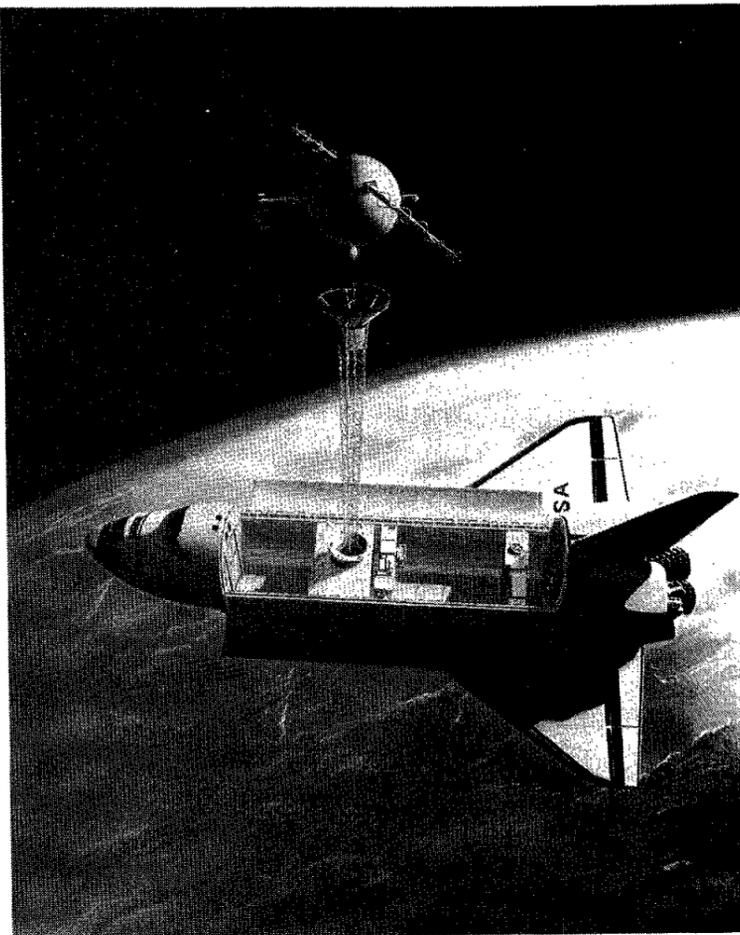
The tether reel's electric motor will unwind the tether while an electric motor at the end of the boom pulls the tether off of the reel and thrusters on the satellite push it away from *Atlantis*.

The deployment will begin slowly, with the satellite moving away from *Atlantis* at about one-half mile per hour. The initial movement of the satellite away from the boom will be at less than two-hundredths of a mile per hour. The deployment speed will continue to increase, peaking after two hours from the initial movement to almost 4 mph.

When the satellite is 3.7 miles from *Atlantis*, a quarter of a revolution-per-minute spin will be imparted to it via its attitude control system thrusters for the science operations with the satellite.

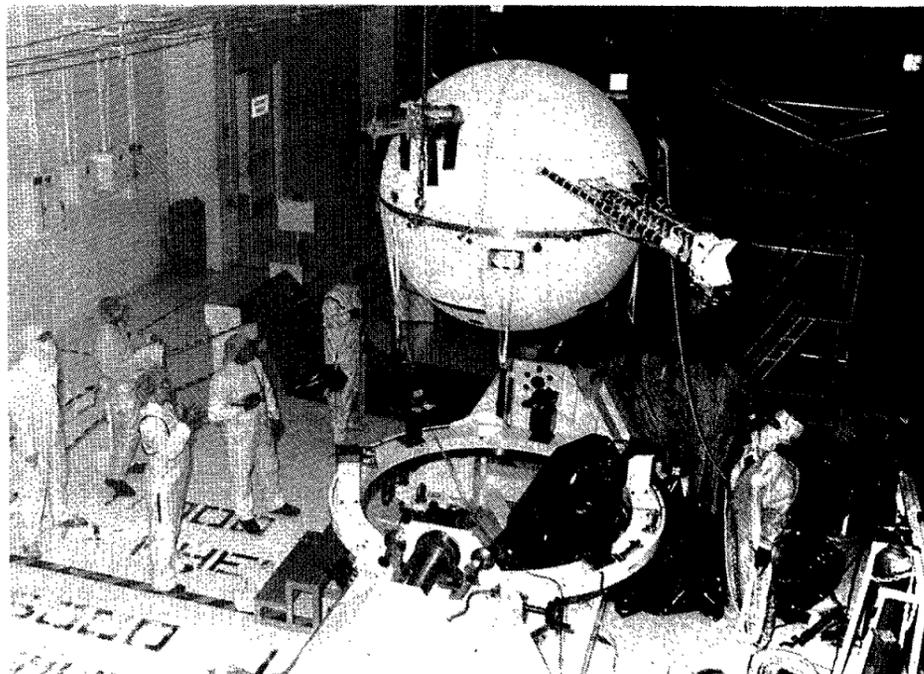
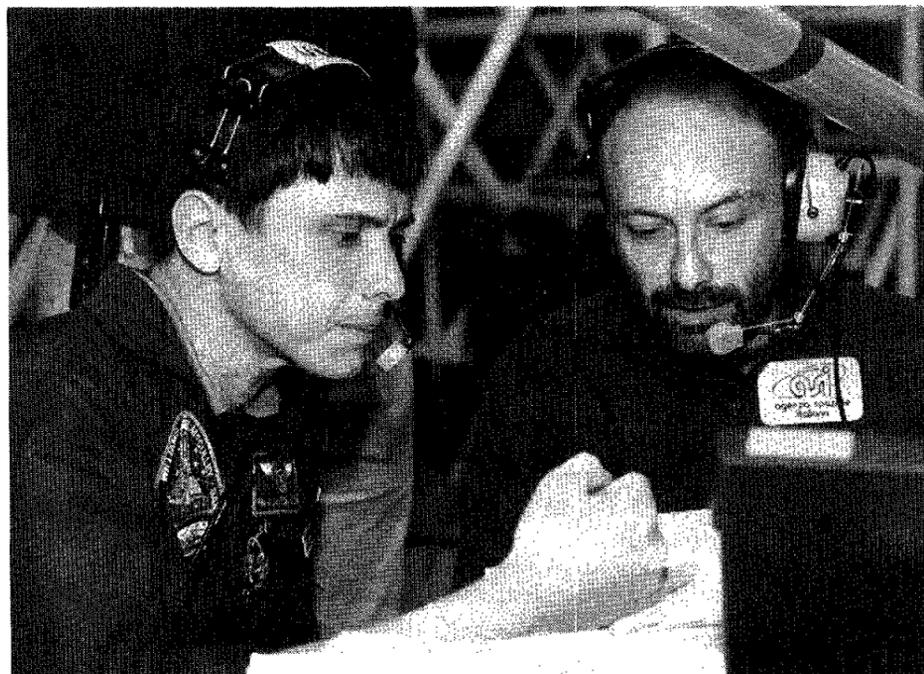
The speed of deployment then will be increased gradually, climbing to a peak separation rate from *Atlantis* of almost 5 mph four hours after the deployment. From this point, the speed with which the tether is fed out will gradually decrease,

Left: An artist's concept of Tethered Satellite System deployment from *Atlantis*' cargo bay shows the deployer system's boom and the tether, which is made of a core of Nomex wrapped with copper wire, insulated with Teflon and covered with braided Kevlar and braided Nomex. This construction offers electrical conductivity and strength. Bottom left: STS-46 Mission Specialist Franklin Chang-Diaz and Italian Payload Specialist Franco Malerba participate in a mission sequence test on TSS at Kennedy Space Center. Bottom right: KSC workers in the Operations and Checkout Bldg. prepare TSS with its satellite support assembly, which now has been installed in *Atlantis*' payload bay.



*'If we learn that a lot of these theories behind tethered operations are valid then we will have had a very successful mission.'*

— STS-46 Lead Flight Director  
Chuck Shaw



## Curie hangs STS-50 plaque

The Public Affairs Office team earned the honor of hanging the plaque in the Mission Control Center at the conclusion of the 13-day STS-50 U.S. Microgravity Laboratory mission.

Lead Flight Director Bob Castle said that while the rest of the flight control teams had a relatively normal flight, the PAO team was challenged as it put together seven in-flight interviews or press conferences with television and radio news media reporters.

Mike Curie, the Media Service Corp. sound technician who arranged and checked out the complicated two-way communications channels needed for the interviews, hung the plaque on behalf of team leader Jeff Carr and the rest of the team.

"The PAO team had to perform triple its normal work load," Castle said.

This was the first time the PAO team had earned the honor of hanging the plaque.

## Garner named safety professional of year

Charlotte Garner of Webb, Murray & Associates Inc., has been named Safety Professional of the Year by the Gulf Coast Chapter of the American Society of Safety Engineers.

The award recognized Garner's outstanding accomplishments in the field of occupational safety and health.

Garner, a senior member of the Webb, Murray technical staff, in the company's corporate director of safety and technical assistant to Richard Holzapfel, chief of JSC's Test Operations and Institutional Safety Branch.

## Gibson receives Bleriot medal for altitude record

Astronaut Robert L. "Hoot" Gibson recently received the Louis Bleriot Medal for 1991 in recognition of his January 1991 altitude



Curie



Gatlinter



Gibson



Duppstadt



Stovall



Martz

record-setting light aircraft flight.

The medal, bestowed by the National Aeronautic Association, is scheduled to be presented at the group's general conference Sept. 14 in Athens, Greece.

Gibson climbed to 27,040 feet, or 3,242 meters, and stayed within 50 meters of that altitude for 90 seconds in his experimental home-built airplane to set the record in the International Class C-1A piston engine aircraft category.

## JSC gets minority award from business council

Bob Duppstadt, JSC's Small and Disadvantaged Business Specialist, recently accepted an award from the Houston Business Council recognizing the center's commitment to contracting with minority and women-

owned businesses.

John Thiel, chief of Administration's Procurement Support Division, and Debra Johnson, chief of the Procurement Operations Branch, joined Duppstadt in accepting the award that recognizes JSC for "outstanding contributions to the objectives of the Houston Business Council evidenced by continued increases in business opportunities awarded to minority/women business enterprises."

## Stovall, Martz earn top secretarial honors

Judith M. Stovall and Phyllis A. Martz recently received the Marilyn J. Bockting Award for Secretarial Excellence.

Stovall, who now is secretary to the head of the Image Sciences

Division's Customer Services Office, was honored for her work as the secretary to the chief of the Imagery Operations Office.

A Certified Professional Secretary, she was cited for her assumption of additional responsibilities when two separate operations were combined into the Imagery Operations Office during a reorganization. This meant providing continued support for photography work and learning how to work with television support activities.

Martz, who is secretary to the deputy director of Safety, Reliability and Quality Assurance, was honored for her expertise and leadership in assessing and evaluating office automation tools. Her work as the administrative assistant to the Commercial Middeck Augmentation Module source evaluation board also was lauded.

## Co-ops integral part of success over 30 years

(Continued from Page 1)

future of space exploration."

Each year, JSC hosts more than 200 graduate and undergraduate co-op student employees in various semester shifts. They work side-by-side with JSC professionals in a variety of positions including engineering, science, public administration and public affairs. They usually work at least three rotations at JSC, attending college classes during alternating semesters.

"JSC has the largest undergraduate co-op program of any NASA center, with students coming from across the country," Kochner said. "Overall, NASA has one of the largest co-op programs of any federal agency."

Former co-ops are represented in almost every directorate, from upper management to the astronaut corps, Kochner said. This summer, 112 co-ops representing 55 different universities, are working at JSC.

"Literally hundreds of JSC employees began their careers through this work and study program," said JSC Human Resources Director Harvey Hartman. "We expect that the co-op program will continue to provide a source of top-flight, highly motivated talent well into the 21st Century."

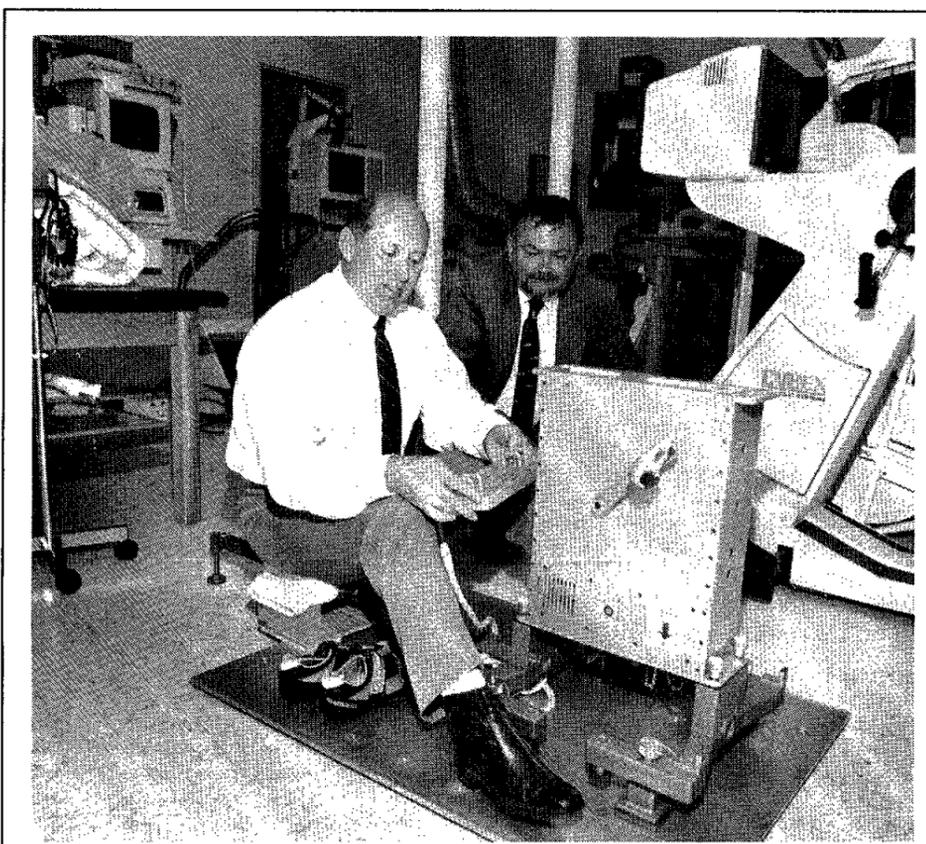
Mark Craig, technical project manager for the Space Station Program Office, said the co-op program allowed him to follow his dream in flight mechanics and space exploration. Craig served his first rotation in facilities engineering, working on hatch design following the Apollo 1 fire. Later, he joined the Engineering Directorate in flight design and was involved in the "skunk works" development of early shuttle designs.

"The co-op program provided the opportunity to try out my chosen profession while there was still time to influence preparations for entering it," Craig said. "The program also gave the chance to meet and learn from the people who, in many respects, founded our profession: Low, Gilruth, Von Braun, Kraft, Faget, Thompson and others."

Jack Boykin, deputy manager of the Orbiter Project Office, said he believes joining JSC in 1965 as a co-op has helped him become a better manager.

"I believe my experiences as a co-op student starting at the GS-2 level provided me with the proverbial benefits and knowledge gained best by 'working your way up from the bottom,'" Boykin said. "I believe my co-op experiences made me appreciate the value of employees at every level and in every job type, and that appreciation has been a key to my effectiveness and my success."

For more information about the reunion, call the Co-op Reunion Hotline at x32697.



JSC Photo by Jack Jacob

**OLD FRIENDS** — Former Los Angeles Dodgers pitcher Mike Marshall checks out the stationary bicycle ergometer in JSC's Exercise Countermeasures Laboratory with Dr. Michael Greenisen. Marshall, now an exercise physiology researcher writing a book about the kinesiology of baseball pitching, toured the countermeasures area last week. Marshall played major league baseball from 1961 to 1981, winning the Cy Young Award in 1974 and setting several pitching stamina records. He and Greenisen worked together at Michigan State University in the 1960s.

## NASA signs pact to enhance space medical research

NASA Administrator Daniel Goldin and National Institutes of Health Director Bernadine Healy signed an agreement Tuesday that will enhance each agency's biomedical research capabilities.

The agreement is intended to stimulate new opportunities in the biomedical and behavioral research community as it provides for greater access to space and involvement by university-based research centers.

At a signing ceremony held with Sen. Barbara Mikulski, D-Md., the agencies pledged to develop programs that apply NASA's unique expertise to practical, medical needs on Earth and in space.

"For the first time in history we are linking up the considerable talents of both our NIH and our NASA research teams, and we are saying to them — work together on what needs to be done both on Earth and in space,"

Mikulski said.

"The joint NASA/NIH venture means that we will have twice the brain power looking at diseases such as neurological disorders, arthritis and even cancer," she added.

In general, the agreement calls for NIH to have the lead role in ground-based research activities and for NASA to have the lead role in space flight medical research activities.

"NIH looks forward to what promis-

es to be a productive exploration with NASA of the inner space of our bodies and cells and the outer space of our solar system and the universe," Healy said.

Initial research topics likely to be addressed include the neurovestibular system (vestibular and balance disorders and sensory motor function) and the musculoskeletal system (bone, muscle and related connective tissue).

## Goldin: No reductions

(Continued from Page 1)

1993.

"There are no plans to have a RIF at NASA Headquarters and this administrator is going to fight to retain a reasonable amount of R&PM funds so we don't have to have a RIF," Goldin said.

"That (the news story) is absolutely, positively not true," he added. "I don't know who came up with that, but they are off on a tangent."

## Cohen receives 'first' plate

(Continued from Page 1)

later. The NIH agreement will combine the medical research talents of the two agencies on important health questions of the day.

"These two important developments broaden the base and deepen the work we will be doing both aboard the shuttle and aboard Space Station *Freedom* in the next few years," he said. "As you may have seen during hearings that Congressman Ralph Hall's subcommittee held at the Texas Medical Center recently, there is a great deal of support out there in the medical community for the investment in Space Station *Freedom*."

"Our goal, through the NIH agree-

ment and through cooperative efforts with the medical community, is to deepen our cooperation, both in basic biomedical research and in the clinical application of the knowledge we gain."

At the eighth annual Spaceweek National Banquet, an international space forum that spans the anniversary of the first lunar landing, Cohen received a symbolic "first plate" as the Texas Space Commission unveiled a new state license plate featuring the Earth, the Moon and a lone star.

The plate, available through local tax assessor office, will cost \$30 extra and proceeds from the sales will help fund the commission's educational efforts.

## Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

## Visit to Russia results in further agreements

(Continued from Page 1)

•study the feasibility of further enhancing the biomedical capabilities on Mir using U.S. instruments; and

•study the possibility of closed-loop life support experiments with humans over different periods of time to define

the requirements for long duration missions.

Goldin said he also discussed the acquisition of a small Russian lander to carry U.S. experiments that would be one of three landers flown on the Russian Mars '94 mission.