



Space News Roundup

Vol. 33

September 16, 1994

No. 35

Goldin takes close look at JSC

NASA Administrator Daniel Goldin told JSC employees Monday that they are NASA's central asset, and that he wants to see what they're doing and hear what they have to say.

That was the reason for his two-day visit and tour of the center, part of a four-month tour that will hit all 13 NASA centers, large and small.

"You are what makes the agency," Goldin told a full house in Teague Auditorium. "Not all the speeches, not all the hardware, not all the contracts, not all the things you hear on the radios and read in the papers."

Goldin said he delivered several actions to JSC's senior managers: decide that JSC will be the best in the world in the area of human space

flight, ensure that the space shuttle continues to fly safely, deliver the International Space Station on schedule and on budget, and require outside peer reviews and benchmarking to measure JSC's success.

"I believe we have a bright, promising future, but it comes back to a willingness to change," he said. "Ten years from now, NASA is going to be very, very different."

Goldin said his objective is to make all NASA projects relevant to today's Americans, and to require each one to justify itself. He said all NASA employees should question the work they do.

"Is it relevant to the future health of America?" he asked. "Will it enrich the minds of the American people with

knowledge that we don't have? Will it inspire people to become educated in math and science? Will it help improve the understanding of our planet? Will it generate new possibilities for new industries, not in the next quarter or the next year, but a decade or two from now?"

NASA employees and contractors also must say what they are going to do, and then do it, he said, and this will be an important criteria in performance reviews and evaluating promotions.

"If you don't do what you say you're going to do, walk into the room and say, 'Boss, I have failed. No excuses. What do we do now?'"

Please see **GOLDIN**, Page 4



JSC Photo by Robert Markowitz

SPIFEX Project Manager George Parma explains to NASA Administrator Daniel Goldin how the JSC-developed hardware will help plan for dockings with the International Space Station.

Cabana new astronaut office chief

Robert D. Cabana is the new chief of JSC's Astronaut Office, replacing Robert L. "Hoot" Gibson, recently named to command STS-71, the first shuttle mission to dock with Russia's Mir space station.

The changes were announced by Flight Crew Operations Director David C. Leestma. "I am confident that Bob will be an effective leader, and his experience and skills are valuable assets," Leestma said.

"This move allows Hoot to devote his full attention and time to commanding the challenging STS-71 mission set to launch in 1995."

Cabana, a Marine colonel, was pilot on STS-41 in 1990, and commander of STS-53 in 1992, and STS-65 this July.

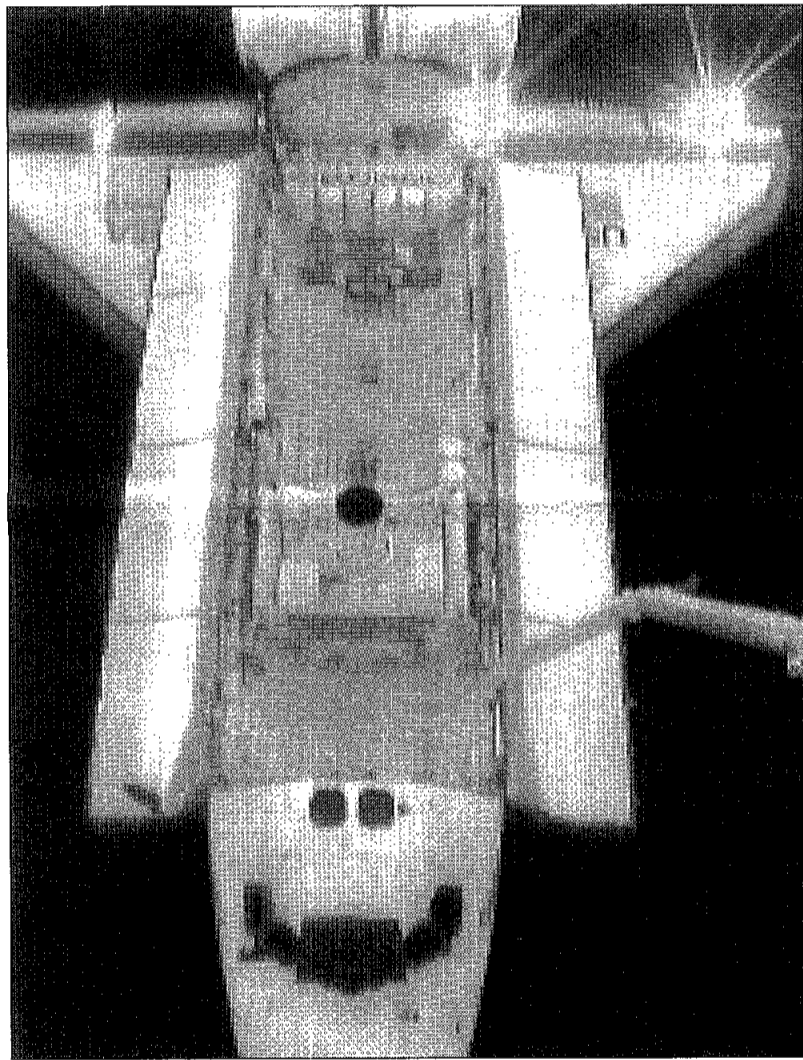
"I am looking forward to leading the dedicated people who make up the astronaut corps," Cabana said.

Gibson, a Navy captain, will continue his training as commander for STS-71 leading a crew of seven, including two Russian cosmonauts.

Gibson flew as a pilot on STS-41B in 1984, and commanded STS-61C in 1986, STS-27 in 1988 and STS-47 in 1992.



Cabana



NASA Electronic Photo

An arms-length view of the Space Shuttle Discovery's payload bay shows the Lidar In Space Technology Experiment, center, and the Spartan-201 solar observing free-flyer, top. Discovery's crew and flight controllers have succeeded in hoarding enough power to allow a 10th day in space. The mission now is set to land Monday.

Discovery duo set to space walk without tethers

By Eileen Hawley

Two of *Discovery's* crew members are to venture outside the orbiter today on the first untethered space walk in 10 years, knowing that they have earned an additional day in space to study the Earth's atmosphere, the solar wind and the shuttle's jet plume firings.

Mission Specialists Mark Lee and Carl Meade were scheduled to leave *Discovery* about 9:30 a.m. CDT today to begin a 6 1/2-hour space walk evaluating several new extravehicular activity tools, including the Simplified Aid for Extravehicular Rescue. SAFER is a small, self-contained propulsion system that attaches to the backpack of an astronaut's EVA suit and provides astronauts with a way to return safely to the orbiter if they break loose of a tether during a space walk.

Lee and Meade also will check out quick-release hooks and tethers, foot restraints and an electronic cuff checklist containing more than 500 pages of information and photographs astronauts can refer to during an EVA. The duo should return to *Discovery* about 4 p.m. today.

Today's scheduled EVA is one of several activities being conducted by the six-member crew following *Discovery's* Sept. 9 launch. The Lidar In-Space Technology Experiment, a laser system using short pulses of laser light, is continuing its studies of the Earth's atmosphere and cloud cover. LITE also has the advantage of being able to penetrate thin or broken clouds to see through to the lower part of the Earth's atmosphere where weather systems form.

Earlier in the mission, LITE took measurements over tropical storm Debby in the Caribbean demonstrating its ability to measure the vertical profiles of clouds, aerosols and surface returns.

Mission Specialist Susan Helms used *Discovery's* robot arm to release the Spartan-201 satellite at 4:30 p.m. Tuesday. Release of Spartan was picture perfect, with the satellite performing two "pirouettes" to signal its health to the crew on board and flight controllers on the ground.

Commander Dick Richards then commanded three separation maneuvers to slowly move the *Discovery*

Please see **HELMS**, Page 4



Russian docking hardware in U.S.

NASA pens contract with Boeing

NASA's prime contractor for space shuttle orbiters, Rockwell Aerospace, took delivery Sunday of the Russian-built spacecraft docking mechanism that will enable *Atlantis* to join up with Russia's orbiting Mir Space Station next June.

In a related development last week, NASA and the Boeing Company announced agreement on the key elements of the prime contract for the International Space Station.

Rockwell procured the docking hardware a year ago from NPO Energia for approximately \$18 million, along with spare parts and technical services to support NASA's first shuttle mission to Mir. The docking mechanism, called the Androgynous Peripheral Docking Assembly was shipped Sept. 8 from the Energia Production Facility in Kaliningrad, near Moscow.

Work will begin immediately at Rockwell's Space Systems Division to assemble the APDA with the Rockwell-built docking system hardware. The APDA will be mated onto a docking base that attaches to a new external airlock designed to fit in the front of the orbiter payload bay supported by a truss structure. The external airlock connects with the existing airlock inside the crew cabin and with a Spacelab module.

Please see **DOCKING**, Page 4

Cameron leads second Mir docking

NASA's second Space Shuttle mission to rendezvous and dock with Russia's Space Station Mir, scheduled for October 1995, will be commanded by U.S. Marine Corps Col. Kenneth D. Cameron.

Joining Cameron on the STS-74 mission are U.S. Air Force Lt. Col. James D. Halsell Jr., pilot, and Air Force Col. Jerry L. Ross, U.S. Army Lt. Col. William S. McArthur Jr., and Canadian Air Force Maj. Chris A. Hadfield.

The primary objective of the six-day flight is to attach a permanent Russian docking module to an orbiter docking system, using the shuttle's robot arm, before placing the docking module onto the Mir Space Station, where it will remain for use during future joint U.S.-Russian missions. Throughout the flight, various life sciences investigations will be performed.

Cameron, 44, has flown twice before on the shuttle, during STS-37 in April 1991 and STS-56 in April 1993. Most recently he was NASA director of operations, Russia, where he worked with Russian trainers, engineers and flight controllers to support the training of astronauts at Star City and to enhance continued cooperation between NASA and Russia's Space Agency.

Please see **HALSELL**, Page 4

For Safety or Security Emergencies

Onsite **483-3333**
 Ellington Field
 Fire **244-7231**
 Ambulance **244-7231**
 Security **244-3333**

Safety Action Hotline **483-7400**

Office of the Director Safety Hotline
for personal, confidential, or anonymous reporting
483-1234

Huntoon sets up confidential hotline

If you think something is unsafe and you think it deserves the center director's personal attention, call 483-1234.

That's the number for the new Office of the Director Safety Hotline inaugurated this week by JSC Director Dr. Carolyn Huntoon as part of a continuing effort to make safety a top priority for every member of the JSC team.

The hotline is designed to facilitate personal, confidential and anonymous reporting. It is part of a new set of tools being used to increase communication on safety and other issues as the center's top managers take personal responsibility for achieving the goal of zero reportable safety incidents.

"Each of us shares the responsibility for ensuring that JSC maintains a safe and healthy environment," Huntoon said, and "must maintain diligence to continue our excellence in safety."

Please see **DIRECTOR'S**, Page 4

Dates & Data

Today

IMAX movie — Space Center Houston will host special showings of "Destiny in Space" at 7, 8 & 9 p.m. Cost is \$5 for adults, \$4 for children age 3-11 years and adults over 65 years. For more information, contact Space Center Houston, 244-2100.

Cafeteria menu — Special: baked chicken. Total Health: roast beef au jus. Entrees: deviled crab, Creole baked cod, baked chicken, beef cannelloni, Reuben sandwich. Soup: seafood gumbo. Vegetables: seasoned carrots, peas, breaded okra, steamed cauliflower.

Monday

Cafeteria menu — Special: hamburger steak. Total Health: vegetable lasagna. Entrees: beef Burgundy over noodles, barbecue smoked link, vegetable lasagna, steamed fish, French dip sandwich. Soup: cream of chicken. Vegetables: buttered corn, steamed spinach, vegetable sticks, navy beans.

Tuesday

Blood drive — Lockheed will host a blood drive from 8-11 a.m. at Lockheed Plaza 4, Hospital & Space Park Drives. For more information,

contact Joe Victor, 483-4791.

Cafeteria menu — Special: turkey and dressing. Total Health: roast turkey. Entrees: baked meatloaf, barbecue spare ribs, liver and onions, baked chicken, French dip sandwich. Soup: black bean and rice. Vegetables: steamed broccoli, California vegetables, breaded squash, savory dressing.

Wednesday

Cafeteria menu — Special: Mexican dinner. Total Health: ground turkey tacos. Entrees: Parmesan steak, beef cannelloni, catfish and hush puppies, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: peas and carrots, ranch beans, mustard greens, Spanish rice.

Thursday

Blood drive — Lockheed will host a blood drive from 8-11:30 a.m. and 1-3:30 p.m. at 2450 NASA Road 1. For additional information, contact Joe Victor, 483-4791.

Cafeteria menu — Special: smothered steak. Total Health: steamed pollock. Entrees: chicken and dumplings, corned beef and cabbage, broccoli cheese quiche, steamed fish, French dip sandwich.

Soup: navy bean soup. Vegetables: steamed cabbage, cauliflower au gratin, buttered carrots, lima beans.

Friday

Cafeteria menu — Special: baked meatloaf. Total Health: light macaroni and cheese. Entrees: baked scrod with Hollandaise, broiled chicken, pork and beef egg rolls, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: stewed tomatoes, seasoned spinach, cut corn, macaroni and cheese.

Sept. 21

Toastmasters meet—The Space-land Toastmasters meets at 7 a.m. Sept. 21 at House of Prayer Lutheran Church on Bay Area Blvd. For more information, contact Darrell Boyd, x36803.

Sept. 23

IMAX movie — Space Center Houston will host special showings of "Destiny in Space" at 7, 8 & 9 p.m. Cost is \$5 for adults, \$4 for children age 3-11 years and adults over 65 years. For more information, contact Space Center Houston, 244-2100.

Sept. 28

Toastmasters meet—The Space-

land Toastmasters meets at 7 a.m. Sept. 28 at House of Prayer Lutheran Church on Bay Area Blvd. For more information, contact Darrell Boyd, x36803.

Sept. 30

IMAX movie — Space Center Houston will host special showings of "Destiny in Space" at 7, 8 & 9 p.m. Cost is \$5 for adults, \$4 for children age 3-11 years and adults over 65 years. For more information, contact Space Center Houston, 244-2100.

Oct. 5

Toastmasters meet—The Space-land Toastmasters meets at 7 a.m. Oct. 5 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Darrell Boyd, x36803.

Oct. 7

IMAX movie — Space Center Houston will host special showings of "Destiny in Space" at 7, 8 & 9 p.m. Cost is \$5 for adults, \$4 for children age 3-11 years and adults over 65 years. For more information, contact Space Center Houston, 244-2100.

Oct. 10

Columbus Day — Most JSC

offices will be closed in observance of the Columbus Day Holiday.

Oct. 12

PSI meets — The Clear Lake/NASA Area chapter of Professional Secretaries International meets at 5:30 p.m. Oct. 12 at the Holiday Inn on NASA Road 1. For more information, contact Elaine Kemp, x30556 or Diana Peterson, x33077.

Toastmasters meet — The Spaceland Toastmasters meets at 7 a.m. Oct. 12 at House of Prayer Lutheran Church on Bay Area Blvd. For more information, contact Darrell Boyd, x36803.

Oct. 14

IMAX movie — Space Center Houston will host special showings of "Destiny in Space" at 7, 8 & 9 p.m. Cost is \$5 for adults, \$4 for children age 3-11 years and adults over 65 years. For more information, contact Space Center Houston, 244-2100.

Oct. 19

Toastmasters meet — The Spaceland Toastmasters meets at 7 a.m. Oct. 19 at House of Prayer Lutheran Church on Bay Area Blvd. For more information, contact Darrell Boyd, x36803.

Swap Shop

Property

Lease: San Jacinto College area, 3-1-1, \$450/mo. Minh, x37492 or 484-2456.

Sale: Friendswood, Forest Bend, 3-2-2, new floors & carpet, lg LR, updates, covered deck & storage, \$69.9k. FPL, x32128 or 996-8823.

Sale: South Shore Harbour, 3-2-5-2D, lg lot, lg deck, 2-story, landscaping, \$119k, x334-4240.

Sale/Lease: Laporte, Glen Meadows, ex cond, 2-2-2, new carpet, wet bar, c'fans, lg backyard, \$600/mo + dep or \$57k, 480-3839.

Lease: CL condo, lg 2 BR, new paint, fans, W/D conn, water pd, \$460 + dep, 326-1761.

Sale: Sterling Knoll, 3-2-2, approx 1300 sq ft, pool, FPL, extras, \$69.9k, 486-9760.

Sale/Lease: Heritage Park, 3-2-2, clean, very sharp, loan is assumable, \$75.9k, Bill, 996-1067.

Lease: University Green TH, 3-2-5-2, ex cond, new carpet/paint, \$875/mo, 280-8155.

Sale: Bay Wind I, condo, 2-1-5-2 spaces, ex cond, gnd floor, W/D incl, \$35k/incl Tom, 333-3992.

Sale: Pearland/Green Teal on golf course, 3-3-3, approx 3300 sq ft, FLP, spa, x32380 or 481-1469.

Sale: Four cemetery lots in beautiful setting w/ig trees, Crosby area, x32380 or 481-1469.

Lease: CL condo, 2-1, pool, gym, security, \$650/mo includes util, 480-5583 or 482-7156.

Sale: Pasadena, 4-2-2, both formals, new roof/vinyl floors, 2100 sq ft, \$78.5k, Tamela, x36155 or Cindy Cole, 479-6489.

Rent: LC-Kemah area horse stalls, part board, lighted arena, a.m. feeding & turn-out, Janice, x39166 or 334-5640.

Sale: BayWind condo, 1 BR, 1st floor, FPL, kitchen appl, W/D conn, \$28.9k owner fin, Charli, 488-8102.

Sale: LC, Bayridge, 3-2-2, \$58k, James, 286-1934.

Sale: Meadowbend, LC, 3-2-5-2, 2100 sq ft, 2-story, FPL, lg deck, new flooring/carpet, new A/C, c'fans, new ext paint, \$85.9k, 486-2414.

Sale: Cemetery lots at Rosewood Memorial Cemetery in Humble, TX, \$395 ea. x40250 or 941-3262.

Rent: Lake Tahoe condo, 2-2, sleeps 6, 1300 sq ft, FPL, avail March 18-25, '95, \$600, Katie, x33185.

Sale: Jamaica Beach, 60 x 135 lot, includes boat slip, \$4.6k, x30228 or 486-4762.

Sale: Tiki Island waterfront 3-2-1 w/boat lift, 2 story, \$129.9k, 409-935-8689.

Lease: Baybrook condo, 1-1-1, top, 749 sq ft, upstairs, corner unit, W/D, vaulted ceilings, new paint/ carpet, \$435/mo + dep, Phillip, x32142 or 480-9701.

Sale: Friendswood, custom 4-2-5-2, lg wooded lot, cul-de-sac, pool, formals, FPL, den, \$135k, 388-1719.

Rent: Alameda Mall area condo, 1-1-5, FPL, W/D, c'fans, elec entry gates, \$415/mo, Chris, 481-6020.

Sale/Lease: LC Meadowbend 3-2-2, 1876 sq ft, lg lot, FPL, A/C, gas, c'fans, \$93.9k or \$925/mo, 334-3191.

Lease: El Dorado Trace, lg 1 BR condo, W/D, res cov pkg, alarm, miniblinds, icemaker, 2 balconies, \$425/mo + dep, Mark, 488-0056.

Lease: Galveston Seawall condo, 6 months or more, fully furnished, \$395/mo, x30737.

Sale: Santa Fe/Alta Loma, 2.5 acres, unimproved, 409-925-1468.

Sale: Meadowgreen 3-2-5-2A, new paint in and out, new wallpaper, FPL, lg kitchen w/walk-in pantry, c'fans, new A/C, lg backyard, \$87k, x333-8183.

Lease: 2-story duplex TH, 2-2-5-1, 1500 sq ft, FPL, lg master BR w/balcony, lg closet, fenced patio, garage + cov pkg, 542-3361.

Cars & Trucks

'86 Ford Tempo, very clean, 76k mi, \$1.8k, Mike, 280-4335 or 334-5082.

'86 Ford F150 XLT Lariat, V8, reg cab, 8' bed, auto, A/C, AM/FM, 67k mi, \$5.5k, Ray, x38876 or 338-1065.

'83 Ford Ranger long bed pickup, good work truck, Steve, x35923 or 334-7542.

'92 Plymouth Grand Voyager LE, dual A/C, quad capt's seats, loaded, low mi, ex cond, \$15.9k, 532-1673.

'87 Shelby Charger, 2.2L Turbo, 5 spd, 47k mi, \$3k, 333-6691.

'86 Olds Ciera ES, 4 dr, blue, 3.8L, V6, 97k mi, needs minor work, \$1.8k OBO, Matt, 333-6289.

'91 Toyota Celica GT-S, 46k mi, red, auto, loaded, sunroof, 2-yr warr, ex cond, \$15.5k, x46361 or 488-0443.

'83 Dodge Salesman Coupe, \$4.5k; '68 VW Bug, \$900, 409-765-8453.

'87 Plymouth Horizon, 4 dr hatchback, runs good, AM/FM/cass, std, \$1,175, x39295.

'72 Orange VW Beetle, chrome wheels, AM/FM/cass, needs work, \$500, Bernd, x31770 or 332-0601.

'84 Audi 4000, good cond, \$1.2k, 474-5272.

'88 Buick Park Avenue, ex cond, 80k mi, loaded, \$5.5k, x35755.

'81 VW Rabbit, auto, 3 dr, AM/FM/cass w/warranty, new shocks/exhaust sys/air, runs great, \$1.4k, x37284.

'71 Karman Ghia, natural amber, new eng, 554-6163.

'90 Prelude 2.05, red, sunroof, tape deck, 5 spd, 20k mi, \$9.1k OBO, x31384 or 487-2383.

'80 Corvette, 74,250 mi, ex cond, white/silver, leather, loaded, \$9.5k nego, x30087 or 484-4068.

'81 Dodge Aries, 22k mi, A/C, auto, \$2k, Dan, 486-9185.

'78 Mercury Marquis, 4 dr, auto, good running cond,

no rust, \$750 nego, John, x38088 or 482-6364.

'85 Honda Prelude, red auto, A/C, sunroof, AM/FM stereo, ex cond, \$3.5k, Carey, x41008 or 486-1427.

'78 Pontiac Trans Am, 400 blue, T-tops, restored, garaged, ex cond, \$5.5k, 331-7435.

'66 Chrysler New Yorker, 4 dr, extensive restoration, eng/brake sys overhaul, emerald green, ex tires, \$5499 OBO, 326-2261.

'87 Astro minivan, dual air, seats 7, 103k mi, ex cond, orig owner, full maint records, \$4.5k, 538-3434.

'89 Oldsmobile 98 Regency Brougham, all pwr, stereo w/cass, loaded, ex mech cond, \$7695, 286-4619.

'77 Corvette, 79k mi, \$12.5k, 409-948-6703.

'87 Lincoln Continental, leather int, 80k mi, ex cond, \$4.9k; '93 Mercury Capri, leather int, red, 5k mi, new, \$13k, Bob, 482-3728.

'86 Toyota Corolla GTA, ex cond, runs great, A/C, PS, new tires, car phone, maint records, Bill, 938-1655.

'86 Toyota Super Cab PU, 114k mi, ex running cond, body good, bed liner w/Leer cov, \$3.5k, Rick, x35578.

'84 Cadillac Sedan DeVille, ex cond, \$2.6k, Gil, x31274 or 941-1129.

'78 Dodge Maxivan, 8 pass, 360 cu in. eng, 129k mi, 12' cargo length, \$950, 488-3276.

'86 VW Scirocco, red, good cond, 50k mi, \$2.5k, David Rinehart, 282-3944 or 486-2451.

'84 Nissan 300ZX, 117mi on rebuilt eng, ex cond, maint records, \$3.2k, x30737.

'82 Toyota Celica, std, 2 dr, A/C, 114k mi, \$1050; '80 Dodge Aspen, auto, 4 dr, A/C, 115k mi, \$650, D. Ton, x33242 or 996-8630.

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Ingenuity takes wing

JSC experiments featured on STS-64

By Mike Fowler

JSC workers made a significant contribution to the research conducted during STS-64, with nine of the flight experiments designed and developed in JSC's Engineering Directorate.

The experiments range in scope from obtaining data for shuttle/Mir and International Space Station flights to proof-of-concept flights for future hardware.

The experiments include the Cold-Gas Plume Generator; Electronic Cuff Checklist; EVA Tools; Rendezvous and Proximity Operations Program; Simplified Aid for EVA Rescue and Recharge Station; Shuttle Plume Impingement Flight Experiment; Supply Water Dumpline Purge Assembly; Trajectory Control Sensor; and Thermoelectric Liquid Cooling Garment.

The main goal of SPIFEX is to provide space station solar array designers as well as shuttle/Mir mission designers with far field plume impingement loads data. In short, SPIFEX is a 32-foot-long extension to the orbiter's remote manipulator system with an experiment arm attached at the end. The arm measures the loads imparted by the orbiter's reaction control system jets together with pressure and heat flux for plume characterization.

Plans called for a total of 86 test conditions in approximately 56 locations about the orbiter to be tested. Project Manager George Parma of the Structures and Mechanics Division stressed that it took a total team effort across the center to meet the requirements and the very ambitious schedule of SPIFEX.

The Cold-Gas Plume Generator is designed to calibrate the load channels of SPIFEX by pulsing gaseous nitrogen in the direction of the instrument sensors. Victor Spencer, project manager from the Propulsion and Power Division, said the CPG consists of a fluid subsystem and an avionics subsystem, all contained in a Get Away Special canister mounted in the payload bay.

The fluid subsystem consists of a high pressure storage system, pressure control system and thruster nozzle, and the nozzle centerline has been precisely positioned to improve the

accuracy of the plume math model. The avionics subsystem is a multi-channel data acquisition and control system designed to control the thruster timing and gather pressure and temperature information from the thruster during a firing event. A Payload General Support Computer operated from the aft flight deck controls the avionics system.

The Simplified Aid for EVA Rescue is a project of the Automation and Robotics Division and according to Cliff Hess, SAFER is a single-string, mini-maneuvering unit that provides self-rescue capability for an EVA crew member in the event of inadvertent separation from the space station or the shuttle. It fits around the Portable Life Support System backpack of the Extravehicular Mobility Unit without encumbering EVA operations. Twenty-four gaseous nitrogen thrusters provide six degrees-of-freedom maneuvering control. Crew member control of the SAFER is provided by a single hand controller that is attached to the Display and Control Module on the front of the space suit.

In conjunction with the SAFER space walk, a detailed test objective has been planned to provide more experience with EVA Tools. The project manager for this flight experiment, Tim Brady of the Crew and Thermal Systems Division, has outlined a set of tests using a number of EVA tools.

The Articulating Portable Foot Restraint Simulator simulates the space station foot restraint. The complete design for station is still evolving, but testing for load-limiting effectiveness is needed now to verify the station structure is not overloaded. The Push Button Portable Foot Restraint with Short Plate and the Push Button Articulating Socket are designed to make PFR installation adjustment easier for the astronaut. The Modified Mini-Work Station is a modification to the existing mini-work station that allows easier adjustment and more efficient retention of tools during EVA tasks. It also includes a push button release similar to the PBAS. The Rigid Tether Assembly is a

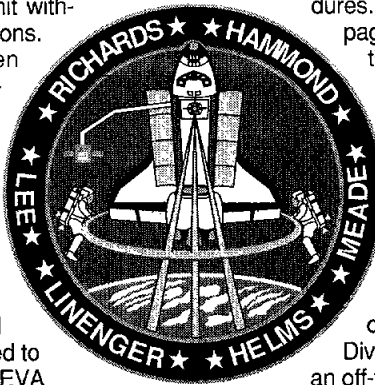
device used for transporting equipment too large for the astronaut to carry conveniently by hand. The device attaches to the MMWS and two different end effectors will be compared for ease of operation. Both the Quick Release Tether Hook and the Modified EVA Tether Hooks are being tested to find a more user-friendly tether. The Modified "Dogbone" Cross Section Handrails and modifications to the existing handrails are designed to improve the astronaut's grip capability and being evaluated to select a baseline configuration to be used on space station.

During an EVA astronauts currently use a paper checklist to provide information about EVA tasks and EMU malfunction procedures. The checklist is limited to 25

pages, is cumbersome to use, time-consuming to assemble, and difficult to maintain proper configuration management control. The Electronic Cuff Checklist is designed to allow the astronaut access to a much larger database, which can be modified on-orbit. The project manager for the ECC, Joey Marmolejo of Crew and Thermal Systems Division, says the ECC consists of an off-the-shelf liquid crystal display, a touch screen, driver electronics, and battery pack enclosed in an aluminum frame surrounded by thermal protection softgoods. The ECC is worn over the space suit arm assembly just as the current paper cuff checklist.

Joe Prather is the project manager for Trajectory Control Sensor for the Avionics Systems Division. The TCS is designed to be a navigation aid for rendezvous, proximity operations, and docking between the orbiter and Mir, space station, and other free flyers. STS-64 marks the second flight of TCS.

The TCS uses two modulated and scanned lasers to provide relative range, azimuth, elevation, and associated rate data between a retroreflector enhanced target vehicle and the orbiter. The pulsed laser can also be used to track a target without a retroreflector at ranges less than 300 meters.



Clockwise from top left, SPIFEX team members surround the hardware prior to its being shipped to KSC last year. Team members include Richard Hill, Technical Services Division manufacturing planner; Matt Ondler, mission manager; Cathy Bole, MOD lead RMS planner; George Parma, Project Manager; and Paul Delaune, avionics lead.

Scott Bleisath, an EVA engineer wears the SAFER device mounted to his extravehicular activity mobility unit during a

test at JSC. SAFER was designed to provide a space-walking astronaut a way to return to the shuttle or future space station if a tether breaks loose during an EVA.

SAFER team members, Roger Schwarz, Mike Stagnaro, Elizabeth Fountain, Bill Studak, Jack Humphreys, Hal Hiers, and Cliff Hess show off their handiwork.

Bob Cobb, Hubert Brasseaux Jr., Bob Steisslinger and Seth Alberts review blueprints for the Supply Water Dumpline Air Purge Device.

Goldin: Do what you say you will do

(Continued from Page 1)

Goldin encouraged revolution, not just evolution, in approaching change. For example, smaller, faster technological demonstrations might be the way to find the most cost effective approaches to future missions in the same way that Mercury and Gemini served as pathfinders for Apollo.

Goldin said he reviewed NASA's launch record and found that in the past decade, it has launched only seven missions that went beyond Earth orbit, and only three of those were under NASA control.

"This is not why I came to NASA," he said, receiving a loud ovation. "I didn't come to be locked in Earth orbit. I came because I believe society will benefit by leaving Earth orbit and exploring our solar system and our universe."

This type of exploration will require cooperation, not just competition, he said. NASA is going to have to work with other agencies and countries. For example, if humans go to Mars, one country may be responsible for putting up a Mars-orbiting communications satellite while another sends landers.

NASA also must continue its efforts to increase diversity, Goldin said.

"This is America's space program, and everybody in America should be able to participate based on their ability, not on their gender, not on the color of their skin. It is crucial that if we are to reach our full potential that diversity in ideas, places and people are involved."

NASA must reach out to America, quickly passing on technologies that can be used to improve the human condition and bolster the economy, Goldin added. This will be one criteria for judging the success of programs.

And all this must be done on a flat budget, he said. He added that there will be no further buyouts or early outs, but that further downsizing will be taken care of through attrition.

He also pledged to establish a dual ladder system that will provide a promotion mechanism in the areas of engineering, science, finance and all support areas.

"Just because we're eliminating management positions to get more efficient doesn't mean you won't get promoted," Goldin said.

In addition, he said it is essential for NASA management to treat its people with dignity and caring, and to nurture creativity. He challenged everyone to demand a contract with their boss that sets four or five milestones for the year.



NASA Electronic Photo
STS-64 Mission Specialist Jerry Linenger, left, and Commander Dick Richards talk with reporters on Earth early in their 10-day mission.

Helms deploys solar observer

(Continued from Page 1)

away from Spartan and into a station-keeping orbit about 50 miles behind the satellite. After release, the orbiter's radar system had difficulty locking onto the satellite to verify separation rates, but following onboard troubleshooting, the radar acquired and tracked Spartan.

Discrepancies between *Discovery's* on-board radar and ground navigation data were being evaluated by flight controllers. Helms was set to retrieve the free-flying satellite Thursday and return it to *Discovery's* payload bay for the return trip home.

Two orbits after its release, Spartan began searching for explanations of how the solar wind is generated by the Sun. The information will be retrieved after landing.

Helms also used the Shuttle Plume Impingement Flight Experiment, a 32-foot long extension to the orbiter's mechanical arm, to study the effects of the orbiter's steer-

ing jet firings. SPIFEX's instruments characterized the heat and pressure from the jets to help plan for dockings with Mir and the International Space Station.

At the conclusion of SPIFEX activities Monday, Helms used the mechanical arm to berth the SPIFEX instrument on the starboard side of the payload bay so that the arm was available for the deploy and retrieval of Spartan. SPIFEX may be unberthed to gather additional data during *Discovery's* extra day on orbit.

In *Discovery's* payload bay, the Robot Operated Materials Processing System automatically processed semiconductor samples in canisters mounted on the side of the bay.

Discovery is scheduled to land about 1:24 p.m. Monday at Kennedy Space Center. The crew should return to Ellington Field about 10 1/2 hours after landing. For homecoming information, call the Employee Information Service at x36765.

Flu season coming; clinic offering shots

The 1994 flu season is fast approaching and the JSC Clinic will offer vaccinations for all NASA-badged and on-site contractor personnel beginning Sept. 26.

Vaccinations will be available daily from 10 a.m.-noon and 2-3 p.m. Shots are recommended for people at increased risk for contracting the disease, including people over 65 years of age or who have chronic cardiovascular or pulmonary system illnesses. The Center for Disease Control further advocates shots for anyone who lives with or cares for someone in this category. It takes two weeks for immunity to the virus to build up in your system after being vaccinated.

Influenza occurs every year throughout the U.S. but it is impossible to predict where or how severe the outbreak will be. Symptoms include fever, muscle aches, chills and respiratory distress. The vaccine may reduce your chance of contracting the virus. The flu vaccine contains three strains of influenza viruses likely to circulate throughout the U.S. during the winter. The 1994-95 vaccine includes type A/Texas, type A/Shangdong and type B/Panama strains.

Vaccinations will not be given to anyone who is pregnant, has a fever, or is hypersensitive to eggs or any other component of the vaccine. The clinic will answer any questions you have about the vaccine. Anyone requesting a flu shot will be asked to sign an informed consent form. For more information, call the clinic nurses station at x37783.

Director's hotline part of aggressive safety program

(Continued from Page 1)

The new hotline is part of an aggressive safety management program that grew out of a centerwide review of safety policies and procedures. While the study showed that JSC is in good shape, center management felt that management accountability could be strengthened and communication improved.

In addition to the new director's hotline, Huntoon reminded employees that there are other avenues for reporting:

- Safety Action Hotline — 483-7400
- On-Site Emergencies — 483-3333
- Ellington Field Emergencies — 244-7231

Docking system arrives; station pact details worked

(Continued from Page 1)

In December, following integrated checkout at Rockwell, the Shuttle/Mir docking system will be delivered to Kennedy Space Center. There it will be installed aboard *Atlantis*, which earlier this year completed a series of modifications that will allow it to accommodate the new system.

For the STS-71 mission to Mir, scheduled for May 1995, *Atlantis* will carry a crew of five American astronauts and two Russian cosmonauts, along with approximately 1,100 pounds of equipment for use on Mir. Two days into its flight, *Atlantis* will dock with Mir, whose crew of two

cosmonauts and NASA astronaut Norm Thagard will have been aboard for 90 days. The *Atlantis* and Mir crews will conduct five days of joint medical research. The original Mir crew, including Thagard, will then join the *Atlantis*' astronauts for the trip back to Earth, while the two new cosmonauts will remain aboard.

The NASA/Boeing agreement establishes, for the first time, a joint position by NASA and its prime contractor on the scope of work, program schedule, cost ceiling and fee arrangement by fiscal year and at completion; establishes contractual terms and conditions; and clears the

way for finalizing the contract before the end of the year.

Space Station Program Director Wilbur Trafton said the agreement reinforces NASA's confidence that the station will be completed on schedule and within the budget limits set by the President and ratified recently by both Houses of Congress.

Randy Brinkley, Space Station Program Manager, noted the agreement marks the third major program milestone completed on schedule this year following the System Design Review in March and the signing of a contract in June with Russia's Space Agency.

"The agreement is a testament to months of intensive effort by the joint NASA/contractor teams which have reviewed every facet of the program in search of the efficiencies and cost savings needed to keep the program on schedule and within budget," Brinkley said.

"We now have the ingredients in place, including a strong, well-defined team, to devote our attention to building the station," said Larry Winslow, Boeing Space Station Vice President.

Boeing is operating under a letter contract signed in February. The letter contract will remain in force while remaining details are worked out.

Halsell pilots second docking flight

(Continued from Page 1)

Halsell, 37, flew on the STS-65 mission in July. He holds a bachelor of science degree in engineering from the Air Force Academy in 1978, a master of science degree in management from Troy University in 1983, and a master of science degree in space operations from the Air Force Institute of Technology in 1985.

Ross, 46, has flown four times aboard the shuttle, during STS-61B in November 1985, STS-27 in December 1988, STS-37 in April

1991 and STS-55 in April 1993. Ross has conducted four space walks on two of those missions.

McArthur, 43, flew on the STS-58 mission in October 1993. McArthur received a bachelor of science degree in applied science and engineering from the U.S. Military Academy in 1973 and a master of science degree in aerospace engineering from the Georgia Institute of Technology in 1983.

Hadfield, 35, was born in Sarnia, Ontario, Canada, and grew up in Milton, Ontario. He



Cameron

Halsell

Ross

McArthur

Hadfield

received a bachelors degree in mechanical engineering from the Royal Military College, Kingston, Ontario, Canada, in 1982 and a master of science degree in aviation sys-

tems from the University of Tennessee in 1992.

The STS-74 flight will be Hadfield's first shuttle mission.

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.

Weight safety: Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Sept. 21 and Oct. 6. Pre-registration is required. Cost is \$5.

Defensive driving: Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is Oct. 15. Cost is \$19.

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

Men's Open C Softball: Tournament is Sept. 17 & 18. Cost to register is \$100 per team.

Golf Lessons: Lessons for all levels. Cost is \$90 for six weeks. For additional information, contact x33345.

Sailing Club: Intermediate sailing classes will be held on Saturdays, Oct. 1 and Oct. 15. For information, contact Richard Hoover at x31360, or 996-7716.

Space News Roundup

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Dates and Data submissions are due Wednesdays, eight working days before the desired date of publication.

Swap Shop ads are due Fridays, two weeks before the desired date of publication.

Editor Kelly Humphries
Associate Editor Kari Fluegel
Associate Editor Eileen Hawley

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.

Renaissance Festival: Tickets: Cost is \$10.50 adults; \$5.25 child (7-12). Festival runs from first weekend in October to second weekend in November.

Seaworld of Texas: Discount tickets: adult \$20.95; child (3-11), \$14.25.

Fiesta Texas: Discount tickets: adult \$18.95; child (4-11) and seniors (55+), \$14.25.

Astroworld: Discount tickets: adult \$13.75.

Moody Gardens: Discount tickets for two of three different attractions: \$9.50

Space Center Houston: Discount tickets: adult, \$8.75; child (3-11), \$7.10; commemorative, \$9.55.

Metro tickets: Passes, books and single tickets available.

Movie discounts: General Cinema, \$4.75; AMC Theater, \$4; Loew's Theater, \$4.75.

Stamps: Book of 20, \$5.80

Upcoming Events: Deep Sea Fishing Trip, Oct. 1; Texas Renaissance Festival Bus Trips, Oct. 15 & Oct. 29; Halloween Dance & Children's Halloween Party, Oct. 29; Travel Fair, Nov. 1.

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