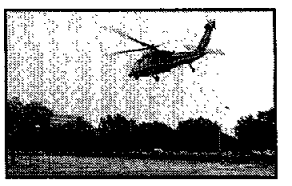
NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas

Wear and tear

A modified Convair 990 can lead to a better understanding of shuttle tire wear and tear. Story on Page 3.



Security Fair

This U.S. Customs Blackhawk helicopter was one of many attractions at last week's security fair. Photo on Page 4.

Space News Roundup

Vol. 32 | October 25, 1993 | No. 42

Office of Space Flight to manage station program

Sheperd selected as station program manager at JSC

NASA's Office of Space Flight will assume responsibility for management of the Space Station Program with Associate Administrator Jeremiah Pearson leading integration for both the shuttle and station programs.

"Our planned space shuttle flight activities are becoming increasingly more involved with our space station planning," NASA Administrator Daniel Goldin said in making the announcement.

"These programs, of necessity, must be more closely integrated. The space shuttle will be a key element of the redesigned space station program and in all presently planned human space flight activities with Russia," he said.

Organizational details of the merger of these two programs at NASA Headquarters are under development and will be announced soon.

Goldin also named astronaut William Sheperd as the space station program manager at JSC. Sheperd currently serves as an assistant deputy administrator-technical at NASA Headquarters and has led the day-to-day transition activities for the space station program. Sheperd and the new Space Station Program Office at JSC assumed responsibility for the program and related transition activities effective last week.

Program directors for the space shuttle and space station will report to Pearson and will be responsible for all activities of the respective programs at NASA Headquarters.

Bryan O'Connor has been designated as acting space station program director, pending selection of the director. O'Connor is currently the director of the space station transition. Thomas Utsman is the space shuttle program director.

The present space shuttle organizational structure will continue to be responsible for the shuttle program.

Sheperd is a veteran of three space shuttle missions and has logged more than 440 hours in space. Selected as an astronaut candidate in 1984, Sheperd flew on STS-27, a Department of Defense mission, in Dec. 1988; STS-41, which deployed the Ulysses solar probe in Oct. 1990; and STS-52, which deployed the Laser Geodynamic Satellite in Nov. 1992. A 1971 Naval Academy graduate, Sheperd earned degrees in ocean engineering and mechanical engineering from the Massachusetts Institute of Technology in 1978.

Willam Shepherd

Merit pay workers join GS system

By Kelly Humphries

The 600 Performance Management Recognition System employees at JSC will begin transitioning into the Agency Performance Management System starting Oct. 31.

The transition for GM pay schedule employees comes after President Clinton signed the Performance Management Recognition System Termination Act of 1993, which permitted one last set of merit pay increases effective Oct. 3.

The Office of Personnel Management has put forth several proposals designed to include the entire federal workforce in a pay-for-performance system that is expected to be the subject of congressional hearings later this year. The sunset cancellation of the PMRS system anticipates the establishment of a new, all-inclusive system.

"We expect additional pay system changes to emerge from congressional hearings later this year," said

Please see **MANAGERS**, Page 4

NASA Photo

Mission Specialist Bill McArthur checks the Research Animal Holding Facility in the Spacelab Life Sciences-2 module. He wears a mask and gloves for protection against particulates.

Columbia crew begins SLS-2 experiments

During its first week in space, the STS-58 seven-member team has been serving as both operators as well as test subjects for more than a dozen experiments aboard the Spacelab Life Sciences-2 module dedicated to studying how the human body adapts to microgravity.

The crew—Commander John Blaha, Pilot Rick Searfoss, Mission Specialists Rhea Seddon, Bill McArthur and Dave Wolf and Payload Specialist Marty Fettman—got a head start on the Spacelab experiments, making some measurements in *Columbia*'s middeck within an hour after launch at 9:23 a.m. CDT last Monday, which was delayed for 10 seconds due to an aircraft in the Kennedy Space center vicinity.

After reaching the 155-nautical-mile orbit, Mission Specialist Shannon Lucid and Payload Specialist Marty Fettman took blood samples from each other and Mission Specialist Dave Wolf recorded their blood pressure readings to gather data on early adaptation to weightlessness. Both Lucid and Fettman wore catheters, inserted prior to launch in their arms to a point near their hearts, to provide direct measurements of central venous pressure during the transition from launch to orbit. Lucid's catheter was removed on the first day with Fettman's remaining in place for an extra day's readings.

Payload Commander Rhea Seddon finished activating the Spacelab equipment right after lunch and the crew began working on experiments examining the heart, the circulation system, reflexes and balance.

Throughout the week, Seddon collected blood, urine and saliva samples from her crewmates, who took biological tracers that track water, calcium, iron and other substances as they are incorporated by the body. Tracking these tracers give scientists clues to changes in the blood, bones, muscles and other body systems as they adapt to space.

Echocardiographs, which work similar to an ultrasound examination,

Please see **SLS-2**, Page 4

On-orbit simulation keeps pilots ready

By Eileen Hawley

On board *Columbia*, John Blaha and Rick Searfoss are conducting the first tests of the Portable Inflight Landing Operations Trainer which measures the effects of space flight on pilot proficiency.

STS-58 is the first of six scheduled test flights of PILOT designed to determine its effectiveness as a training tool. Using a work-station class laptop computer and a hand controller, PILOT replicates the orbiter's response to inputs from the pilot "flying" it. With the shuttle engineering simulator software loaded in the computer PILOT closely mimics the orbiter's handling characteristics.

During the mission, Blaha and Searfoss will fly PILOT on *Columbia*'s flightdeck. The simulator hand controller attaches behind and slightly to the left of the orbiter's hand controller and the computer is secured to the window in front of the pilot's heads-up display. When installed, the computer screen provides the operator with the same field of view available to the commander during reentry.

The pilot can select either a heads-up display or instrument panel display showing the attitude director indicator, horizontal situation display and horizontal situation indicator during the reentry sequence. PILOT simulates flight from the moment the orbiter achieves subsonic flight at about 45,000 feet to touchdown approximately two minutes later. The simulator's landing sequence is timed to duplicate a nominal orbiter landing from its approach to the heading alignment circle through nosegear touchdown.

Both Blaha and Searfoss have established preflight baseline perfor-

Please see **PILOT**, Page 4

MMU developer

Ed Whitsett dies

Long-time JSC employee Charles "Ed" Whitsett died Oct. 14 following a brief illness.

Whitsett, most recently manager for projects in the Automation and Robotics Division, was instrumental in the development of the manned maneuvering unit which expanded extra-vehicular activity capabilities. He was also instrumental in the development of EVA hardware activities for satellite retrieval and repair missions.

On Sept. 16 he received the NASA Exceptional Service Medal citing his "significant contributions to the NASA mission over many years with a sequence of successes nearly unparalleled."

Whitsett began his NASA career in 1966 as a member of the flight control team for the Gemini missions. In 1967, he became principal investigator for an early experimental MMU for Skylab. In 1977, Whitsett retired from the Air Force to continue his NASA career in the Crew Systems Division.

The highlight of Whitsett's career came in 1984 when as project manager, he particpated in the first successful MMU shuttle test.

Whitsett is survived by his wife, Joan, his three children, Edie, Ben and Steve, his mother, Lucile, and several grandchildren.

Ed Whitsett tests the manned maneuvering unit he helped to develop during the engineering evaluations in 1988.

FY94 budget update

NASA limits ASRM spending

NASA took action last week to limit expenditures on the Advanced Solid Rocket Motor program pending congressional budget action that would end the program.

NASA informed its field installations involved with the ASRM program that if the pending congressional appropriations bill becomes law, it would require termination of the ASRM program. Accordingly, NASA issued direction to its field installations to "take immediate action to mitigate the costs of terminating the ASRM program."

The U.S. House of Representatives is taking final action on the Fiscal Year 1994 VA-HUD and Independent Agencies Appropriations Bill and is expected to pass the bill by today. The House amended the House-Senate conference committee appropriations bill to delete an additional $57.5 million from the ASRM program. If the Senate also approves the bill with the proposed House amendment, the language effectively will terminate the ASRM program once the President signs the bill into law.

If changes to the bill are enacted, $100 million in Fiscal Year 1994 will be appropriated to cover the ASRM program termination costs. Should the final appropriations bill language be modified, further program direction will be sent to the NASA centers.

NASA Headquarters has directed all affected offices to develop an implementation plan to terminate the ASRM program within the available budget—$100 million plus any uncosted or unobligated program funds. The plan is to be provided to Headquarters no later than Nov. 1.

The field installations have been directed to provide as detailed information as possible to all ASRM contractors about the recent congressional action and its consequences should the bill become law to assist them in their planning.

Please see **ASRM** Page 4

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.

EAA Texas Renaissance Festival Bus Trips — Nov. 13, includes bus transportation and admission: adult, $16; child (5-12), $11; child (under 5), $7.

Texas Renaissance Festival — Weekends through-Nov. 14. Discount tickets: adult, $9.95; children 5-12 years, $5.95.

EAA Halloween Dance — 7 p.m.-midnight, Oct. 30, Gilruth Center. Tickets on sale Oct. 13-27. $15 per person. Costumes encouraged

EAA Children's Halloween Party — Oct. 30, 10 a.m.-12 p.m.. Tickets on sale until Oct. 27. adult $1, child $4.

"A Tuna Christmas" — 2 p.m., Sunday, Dec. 19 at the Cullen Theater. Tickets on sale through Nov. 5 - $18, deposit required at time or order.

Entertainment '94 Coupon Books — Bay Area/Galveston/Downtown or FM 1960/Downtown: $30 each, $1 off first book for civil servants.

Space Center Houston — Discount tickets: adult, $7.50; child (3-11), $4.50; commemorative, $9.95.

Metro tickets — Passes, books and single tickets available.

Movie discounts — General Cinema, $4.50; AMC Theater, $3.75; Loew's Theater, $4.

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. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday-Friday. 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. Nov. 3. Pre-registration is required. Cost is $5.

Defensive driving — Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is Dec. 4.. 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.

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

Aikido — Martial arts class meets from 5-7:30 p.m. Tuesdays. Cost is $15 per month.

Country and western dance —Line dance class meets from 7-8 p.m. Tuesdays. Cost is $10 for six weeks.

Writer's workshop — Fiction-writing workshop meets from 6:30-9 p.m. Wednesdays. Cost is $80 for five weeks.

Intercenter Run — Run or walk a 2-mile or 10-K course through Oct. 31. Turn times into Center and receive a t-shirt.

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

JSC

Dates & Data

Today

Drug-free campaign — National Red Ribbon Campaign runs through Oct. 31. Wear a red ribbon to show your commitment to a drug-free America. Ribbons are available from Employee Assistance Program office in Bldg. 32, Rm. 132 or the medical clinic in Bldg. 8

Flu shots — The JSC Clinic will offer influenza vaccines from 10 a.m.-noon and 2-3:30 p.m. through Jan. 31. For more information, call the clinic at x34111.

Cafeteria menu — Special: Italian cutlet. Total Health: roast beef au jus. Entrees: chicken a la king, enchiladas with chili, baked lasagna with meat, steamed fish, French dip sandwich. Soup: split pea and ham. Vegetables: Brussels sprouts, oriental vegetables, buttered carrots, lima beans.

Tuesday

Apollo tribute — Space Center Houston will honor the 25th anniversary of Apollo 7 with a buffet dinner and program starting at 7 p.m. Oct. 26. Astronaut Gene Cernan will be master of ceremonies and Apollo 7 crewmen Walt Cunningham and Wally Schirra will make a special presentation. Tickets are $15.50 per person. For more information, call 244-2100.

Cafeteria menu — Special: stuffed cabbage rolls. Total Health: roasted turkey. Entrees: turkey and dressing, country style steak and hash browns, beef ravioli, baked chicken, French dip sandwich. Soup: tomato Florentine. Vegetables: Italian blend, okra and tomatoes, corn cobbette, navy beans.

Wednesday

Video presentation — JVC Professional Products Co. will demonstrate new products from 9 a.m.-3 p.m. in Bldg. 111 conference center. For more information, contact Dean DesJardins at x34132.

Halloween dance — Last day to purchase tickets for the Halloween Dance is Oct. 27. Tickets are $15 per person. For more information, call Mike Gaudiano at x58318.

Russian speakers — Practice russian language skills from 11 a.m.-1 p.m. Wednesdays in Bldg. 3 cafeteria. For more information, call Jack Bacon at x38725 or Amy Mendez at x38066.

JAS meets — JSC Astronomical Society meets Wednesdays from 12-1 p.m., Bldg. 31, Rm. 129. Dr. Al Jackson will report on the 25 DPS meeting. For more information, call Al Jackson at 333-7679.

NMA meets — JSC chapter of National Management Association meets at 5 p.m. in the Gilruth Center Ballroom. Dr. Bobby Alford of Baylor College of Medicine will speak on "Space Station Redesign, Views from a Vest Committee Insider." For more information, call Allison Kruest at 244-7115.

Cafeteria menu — Special: pepper steak. Total Health: stir fry pork with rice. Entrees: liver and onions, catfish and hush puppies, stir-fry pork with rice, steamed fish, Reuben sandwich. Vegetables: steamed broccoli, yellow squash, macaroni and cheese, vegetable sticks.

Thursday

Canine demonstration — Employee Assistance Program will present a noon-time seminar on U.S. Customs Department efforts to stop drug trafficking along the Texas coast from 11:30 a.m.-12:30 p.m. in the Bldg. 30 auditorium. Presentation includes a demonstration of the drug-sniffing canine corps. For more information, call EAP at x36130.

Russian Speakers — Practice Russian language skills from 11 a.m.-1 p.m. Thursdays in Bldg. 3 cafeteria. For more information, call Jack Bacon at x38725 or Amy Mendez at x38066.

Cafeteria menu — Special: chicken fried steak. Total Health: fat-free vegetable soup. Entrees: beef tacos, scrod with Hollandaise sauce, steamed fish, French dip sandwich. Soup: navy bean. Vegetables: spinach, cut corn, breaded okra, pinto beans.

Friday

Cafeteria menu — Special: tuna noodle casserole. Total Health: steamed salmon steak. Entrees: steamed salmon steak, roast beef, baked chicken, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: French cut green beans, cauliflower with cheese, green peas, black-eyed peas.

Oct. 31

Bike tour — The Lions Eye Bank of Texas and the JSC Bike Club are sponsoring the 15th Annual Texas Coastal Cruise. The ride will begin at 8 a.m. Oct. 31 at Clear Lake Park on NASA Road 1. For more information, call 798-5510.

Costume contest — Space Center Houston is having a space-themed contest for children age 12 and under. Children in costume will be admitted free when accompanied by a paying adult. For more information, call 244-2100.

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 AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: Friendswood, Wedgewood Village, 3-2-2, updated kitchen, FPL, c'fans, new carpet/paint. 482-0874.

Rent: Timeshare condo, anywhere in world, $575/wk domestic, $600/wk international. 282-3339 or 286-8417.

Lease: Seabrook duplex, 2-1-1, Avail 10-15, $485/mo. x48084 or 474-5705.

Sale: LC, Meadowbend, 4-2-2, FPL, c'fans, new landscape/paint, $70.9k nego, assum. Peter, 526-1853.

Rent: Cancun beach-front condo, 2 baths, full kitchen, dly maid service, sleeps up to 8 adults, $500/wk. Katie, x33185 or x37990.

Sale: LC, Bayou Brae, 4-2-2 Colonial, new carpet/roof, detached all brick garage, lg lot, covered patio. 332-6325.

Sale: Univ Green TH, 3-2.5-2, new A/C, recent upgrades, $73.9k. Ellen, x48919 or 488-7383.

Sale: Taylor Lake Village, 4-2.5-2, many upgrades, 2900 sq ft, custom features, $180k. 474-5609.

Sale: Shoreacres, 4-2-2, 1850 sq ft, custom drapes, new vinyl, includes additional wooded lot, $89k. 470-2592.

Sale: Brook Forest, 3-2-2, study, new paint, hot tub, c'fans, FPL, lg rooms, high ceilings, upgrades, 2300 sq ft, was $115k now $124k. x33784 or 488-0416.

Sale: Cancun, Mex, 5-star resort, 2-2, Nov 13-20, '93, was $1400, now $700. 992-3876.

Rent: Southern Colorado, 2 BR, sleeps 5, no smoking/pets, day/wk/mo or longer. Bob, x30825 or 998-7372.

Rent: Arkansas cottege on Blue Mountain Lake, furn, wooded, 4 acres, screened porch, $250/wk, $50/day. x33005 or 334-7531.

Sale/Lease: Nassau Bay, 4-2-2, recently remodeled, gas, big trees, lake view, $114.5k/$850. Minh, 333-6806 or 484-2456.

Sale: Piper's Meadow, 4-2.5-2, ex cond, new carpet/vinyl, fans, miniblinds, gar door opener, immediate occ. Wayne, x36617 or 291-9020.

Sale: LC, Countryside South, contempo 3-2.5-2A, 2 story, updated paint/carpet/c'fans, custom window shades, ceramic tiled kitchen, lg corner lot, $81.5k. x38413 or 554-2728.

Rent: New Orleans French Quarter condo, week of Oct 22-29, fully furnished, sleeps 4, $400. 282-6422 or 280-8927.

Sale: Univ Green, 3-2-2, ex cond, new A/C, c'fans, decks, custom blinds/drapes, all appliances, $83k, assum, no app, 9.5%, eq $18k, owner finance 2nd w/$10k down. 488-0345.

Cars & Trucks

'81 Olds Cutlass, 4 dr, 63k mi, loaded, $1.4k. Jack, x33741 or 488-1222.

'87 Ford E150 van, 6 cyl auto, A/C, stereo, CB, carpet, paneling, $4,150. Mike, 480-7901.

'90 Mustang 5.0, blk, 5 spd, all pwr, Alpine CD, flowmasters, $9,200. 471-5248.

'86 Ford Tempo, 62.5k mi, good cond, $2k. Donna, x30261 or 334-5082.

'84 Chev S10 PU 4X4 ext cab, loaded, $3,250. 953-5430 or 409-935-9215.

'88 Ford Custom van, Tratec conversion, V8, rear A/C, running bds, 4 captain's reclining seats, rear seat/bed, good tires. x33787 or 332-5725.

'93 Ford F-150 Supercab, 5.0L V8, loaded, captain's chairs, locking fiberglass bed cover, 17k mi, $16k. Tom, 333-7497 or 992-4891.

'91 Mustang, LX htchbk, 5.0L, sunroof, 31.5k mi, loaded, $9,700. x31004 or 331-0742.

'68 MG Midget Roadster body, no engine, $650 OBO; '78 MGB Roadster parts, body w/front and rear suspension, $300 OBO. 482-7181.

'88 Delta 88 Royale, dk brown, 49k mi, auto, V6. Pam or Ed, 723-1551.

'91 Ford Probe GT, sunroof, stereo, alarm, 20k mi, ext warr, $10k OBO. Dan, 335-2533 or 332-3093.

'75 Chevy Nova LN, needs work. $1k. 554-4381.

'90 T-Bird S.C., dk blue, every option but CD and leather, $11k OBO. x34204 or 480-2954.

'78 Cadillac, 2dr, CB, AM/FM stereo, burgundy w/white vinyl top, clean, runs good, $1k OBO. 943-8788.

'76 Datsun 280Z 2+2, 66k mi, electrical problems but runs, some body rust, new tires, $1.6 OBO. Gibson, x36224 or 488-6024.

'80 Datsun B-210 station wagon, white, new battery and carb, 5 spd, $750 OBO. Ray, x41010.

'78 Porsche 928, brown w/leather int, auto, ex cond, 75k mi, $8,500. Bill, x48889.

Boats & Planes

'89 18' Sea Ray, V6, 175HP, 30 hrs, ex cond, trlr and other accessories incl, $9.8k. Ray, x41063 or 334-4124.

'89 Wellcraft, 28', Monaco, twin Merc 260's, bimini and tonneau, 3.0 gen, 12k Btu A/C, elec head and shower, hot water, microwave, sleeps 4, Yamaha 10 CD player, $35.9k. Alan, 521-2578.

22.5' Sea Ray Cuddy Cruiser, 228HP Mercruiser I/O, dual batteries, color Furuno, VHF, $8.5k. Mark, x38013 or 992-4132.

Surfboards, 6'2" Bob Martin Hurricane w/matching leash, $125; 7'4" Leroy Ah Choy Hobie Hawaii big wave board w/interchangable fin, $50. Kevin, x36654 or 480-6264.

17.5' Classic fiberglass boat, walk-thru, I/O, V6, OMC ex cond, easy-load roller trlr, $3.6k. x49775 or 643-2104.

Cycles

27" Fuji men's touring bike, ex cond, $75. Mark, x38013 or 992-4132.

'88 Hurricane, 19k mi, tank bag, helmet, $2.5k OBO. x34204 or 480-2954.

Audiovisual & Computer

MXR 6-band equalizer for guitar or microphone, $20. x35258 or 482-0374.

Photographic

Olympus OM-PC 35mm camera w/50mm 1.8f lens and case, good cond, $175; Mamiya ZE-X 35mm camera w/50mm 1.7f lens, 28-50 zoom, 80-200 zoom, misc equipment, $375, all manuals and boxes, both have manual and program modes. Jeff, 333-7007 or 326-5098.

Bogen b/w enlarger and darkroon supplies, trays, mixers, bottles, paper, $250. Robin, x47025 or 334-6558.

Pets & Livestock

Kittens, 12 wks old, housebroken. Jenny, x35007 or 339-3092.

Chihuahuas, AKC, 2 males, 2 females, 4 mo old, shots, wormed, $200 ea. 534-4667.

Musical Instruments

Bundy flute w/case, ex cond, $200. Steve, x36725.

Yamaha professional upright piano, polished ebony, was $10k, now $6k. Friendswood area. 482-5870.

Kimball studio upright piano, oak cabinet, ex cond, $500; Selmer tenor sax, ex cond, $1.6k. Shirlie, 664-2464.

Ibanez RG550 solid body elec guitar w/active EMG pickups, tremolo, hardshell case, metallic blue, was $1.3k, now $495; Peavy "Classic" model guitar amp, ex cond, two 12" speakers, reverb, tremolo, footswitch, chorus, was $800, now $395, will layaway. 280-9621.

Household

Rattan dining rm table w/formica top, 4 chairs; rattan couch and chair, matching coffee and lamp tables w/formica tops; rattan desk and chair, other accessories, $600 OBO. Steve, x37152 or 992-7049.

Wicker chaise lounge chair, natural color; white wicker papasan chair w/matching table, $140 OBO. Steve, x37152 or 992-7049.

'86 Kenmore washing machine, almond, $50 OBO. Vanessa, x45284 or 484-2515.

Antique BR chest and dresser w/triple mirror, marbleized top/mahogany wood, will not split up pair, $500. 333-1297.

Twin bed w/frame, $50; dresser, $50; book case, $30; coffee table, $30. 333-6573 or 488-4813.

6' x 9' blue/black shag rug, $25; dbl mirror sized dresser, $200; single sz mattress, $15; 81" rose colored lined drapes, $25; contempo style cough, $350. x38182.

Regina steemer carpet cleaner, uses hot water and shampoo cartridge, was $70, now $35. Jim, x39229 or 482-7873.

Kg sz waterbed, motionless mattress w/frame, one yr old, was $500, now $200. 534-4667.

Gas range w/lg capacity oven and broiler, $175; Wards elec heavy duty clothes dryer, 20 lb capacity, $175. Henry, x37254 or 409-938-4786.

Noritake china set, "Misty" pattern, white on white w/silver rims, incls 8 place setting dinner and salad plates, bowls, cups, saucers, hors d'oevres plates, ex cond, unused, $100 OBO. Robin, x47025 or 334-6558.

Persian rug, 106" x 70", blue/gold, $50; grey formica kitchen table w/leaf, $10. Jeannette, x47757 or 992-5946.

Antique brass bed, full sz, $300. 944-8312.

Oak veneer dinette, round w/leaf and 4 chairs, $85; student desk, white formica top w/2 drawers and storage space, $30; TV/stereo entertainment center, oak veneer w/storage door and book shelves, $45. Susan, x33076.

Rattan dinette set, round table w/4 chairs, $75 OBO. Bob, x35900 or 334-4428.

Qn sz mattress, box springs and frame, unused, $250. 282-4558 or 486-1727.

Panasonic 60" front projection TV monitor, $600 OBO; sectional sofa w/qn sleeper, light beige, $250; 4 dinette arm shairs, oak frame, wicker seat and back, $60; 1.2 cu ft microwave, $40. x37010 or 334-2612.

Cherry hutch, made in 1940s, good cond, two doors enclose bottom, open top w/shelves, $300. 282-4558 or 486-1727.

Bunk beds, ex cond, matching comforters, dust ruffle, $125. x33739 or 482-0329.

Mitsubishi lg screen TV, 45", stereo, all features, was $3.3k, now $1.6k or trade for working car. 488-0345.

Carpet, rust/cinnamon brown, good cond, 150 yds, $300 for all or $3/yd. Mark, x38013 or 992-4132.

Decorative bronze eagle w/chain for hanging, $20; antique brass FPL screen, 31" h x 38 w, $20. 480-3424.

Two piece lighted china cabinet, ex cond, $700 OBO. 554-7669.

Wanted

Want to buy home for low down payment in Clear Lake area, Houston, or Galveston. 482-0874.

Want female roommate to share 3 BR in LC, the Landing, $300/mo + 1/2 util. Cathy, x47802 or 554-4579.

Want to buy good used car or minivan. 867-8820.

Want infant backpack carrier. Mary, x36621.

Want CGA monitor. x47995.

Want roommate to share Friendswood 3-2-2, new house, garage parking, nonsmoker pref, $300 + 1/2 util. 216-4001 or 992-5765.

Want old paper, toy, TV, and movie collectible, will pay cash. Duane, x36145 or 428-7419.

Want van pool riders, Sugar Land Westwood Park & Ride to JSC area. Alice, x35234.

Want Go-Kart in working cond or nor, prefer live axle. Jeff, 996-1365.

Want van pool riders, West Loop Park & Ride to JSC area. Richard Heetderks, x37557.

Want part time kitchen help at Gilruth Center, waitress, dishwasher positions, eve shift 4:00 pm to 9:30 pm. Pat, x30326.

Miscellaneous

Camaro trlr hitch, class II tube type, $40. Jeff, 996-1365.

Two 4' x 8' aluminum solar panels, BO. 482-0874.

Riding lawnmower, 30" cut, 11HP, 8 spd, ex cond, $575. Mark, x38013, 992-4132.

Flex band exercise machine, $50; R/C car w/charger, 2 batteries, $75; Radio Shack R/C car, $30. Tom, 333-7497 or 992-4891.

Qn sz sleeper sofa, beige w/blue stripes, $100; DP Pacer stationary bike, ex cond, $50; Craftsman 10" band saw w/extra blade, $75; scroll saw, $50. Liz, 471-9626.

Four Texas vs Texas Tech football tickets, good seats, Oct 30 in Austin, 2 or 4 tickets for face value. 996-5339.

'84 Skamper pop-up camper, 13', hard top, vinyl sides, A/C, good tires, ice box, stove, awning, ex cond. X33787 or 332-5725.

Pearson target bow for juvenile, arrows, case, arm guard, balance arm, adjustable sight, 40 lb pull, ex cond, $250. Gibson, x36224 or 488-6024.

Infant car seat/carrier, $15; 2 walk and push toys, $10 ea; umbrella stroller, $10; crib linen set, pastels w/bears pattern, $30. 212-1320 or 486-7621.

Antique oak buffet, $350; antique oak draw leaf table, $300; antique 1850 oak hutch, $800; Lifestyler treadmill, $75. 333-1297.

Child's bicycles, $15; child's rollerblades, $10; child's leather softball gloves, right and left handed, $8 ea. Donna, x30261 or 334-5082.

Exercise machine, treadmill, Lifestyler 1900, incline lift, ex cond. James Emerson, x33601 or 280-8741.

Remington model 700 BDL varmit special calibre .308, 3x9 pwr scope, new, $575. 992-2306.

Four 15x8 reverse gold and chrome Mclean rims, 3 mo old, $1,500. 471-5248.

Retired David Winters, Tom Clark gnomes for sale at orig price, ex cond. Katie, x33185 or x37990.

Two scuba tanks, 1 reg w/guage, 1 full face decor mask, $250; 1 BC, $200; RCA 16" color TV, $100 OBO. 332-3033.

Dynajet engine for model airplane/boat/car, runs on regular gasoline, was $350, now $75. Jim, x39229 or 482-7873.

Chest freezer; ping pong table w/acc; black naugahyde swivel rocker w/ottoman; Sears open hearth l.ne 3 cushion sofa; Sears artificial FPL logs; . ghted curio cabinet w/mirror back; Lane cedar chest; Singer sewing machine w/3 drawer cabinet. x33208 or 388-2005.

Graco baby stroller, $40; 28 piece wok, unused; 21" welding/cutting torch w/handle, $50. 480-3424.

Dorm refrigerator, ex cond, $85; 14 interior doors, some hardware, $3/door; rubber cargo king mat and tail gate cover for full sz PU, $35. Ken, x35999 or 486-5432.

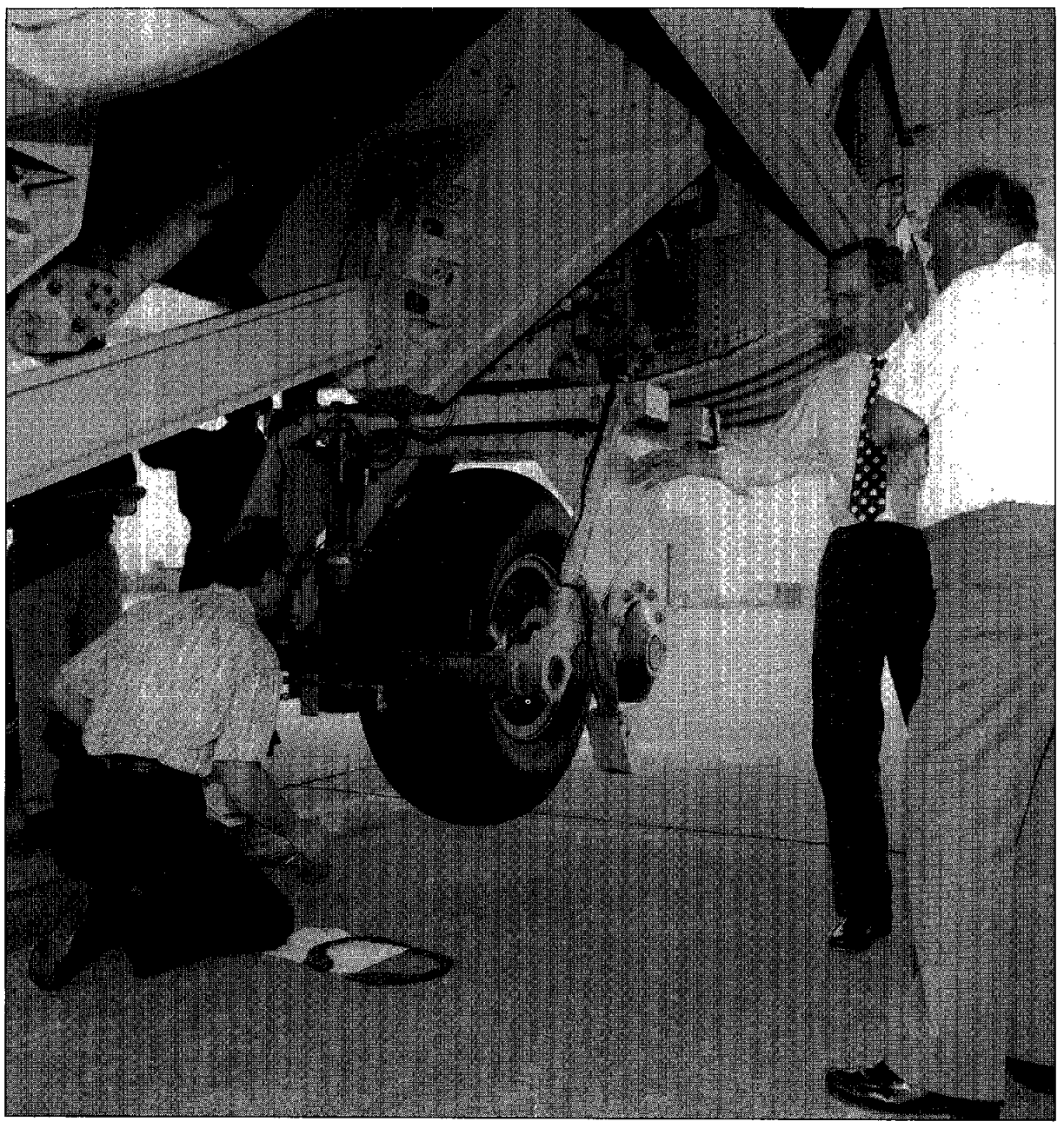
New Pro Mizuno 1st base glove, right hand, was $200, now $100. Eric, x31917.

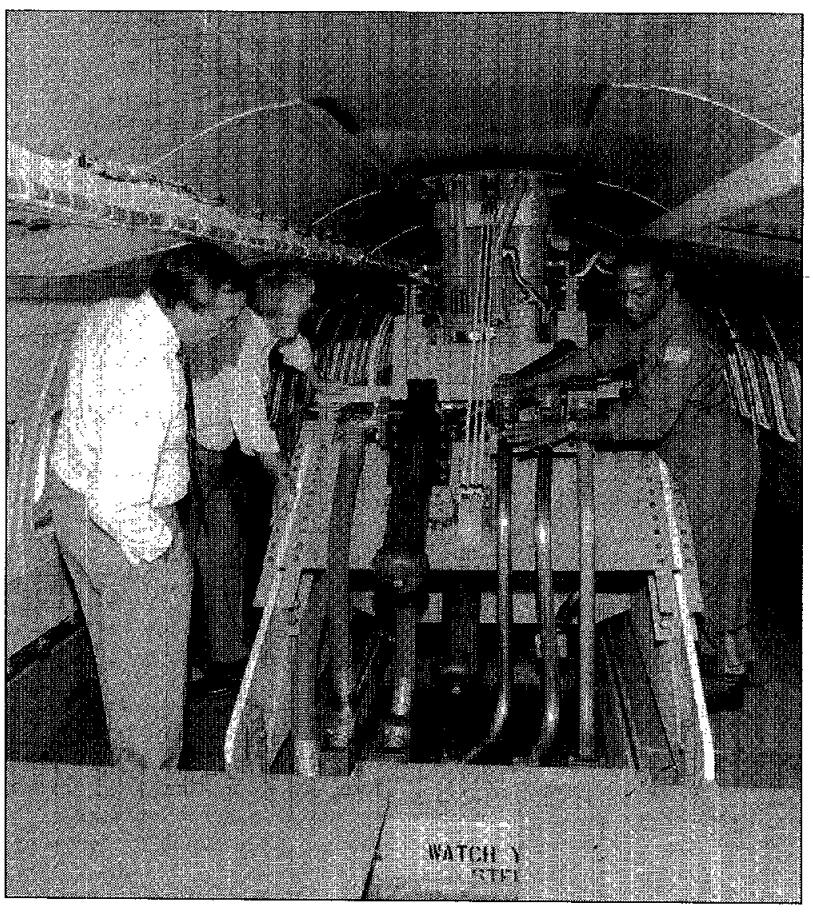
Snapper self-propelled lawnmower w/all attachments, ex cond, $110; brass/porcelain kg sz headboard, $75; new Champion stainless steel juicer, $200 OBO. Rick, x48842.

Rowing machine, ex cond, $50 OBO. x47748.

Two Pres and First Lady Gold Charter memberships, no monthly rate increase, $6.50/mo, Executive Club access, $750 ea. x44664.

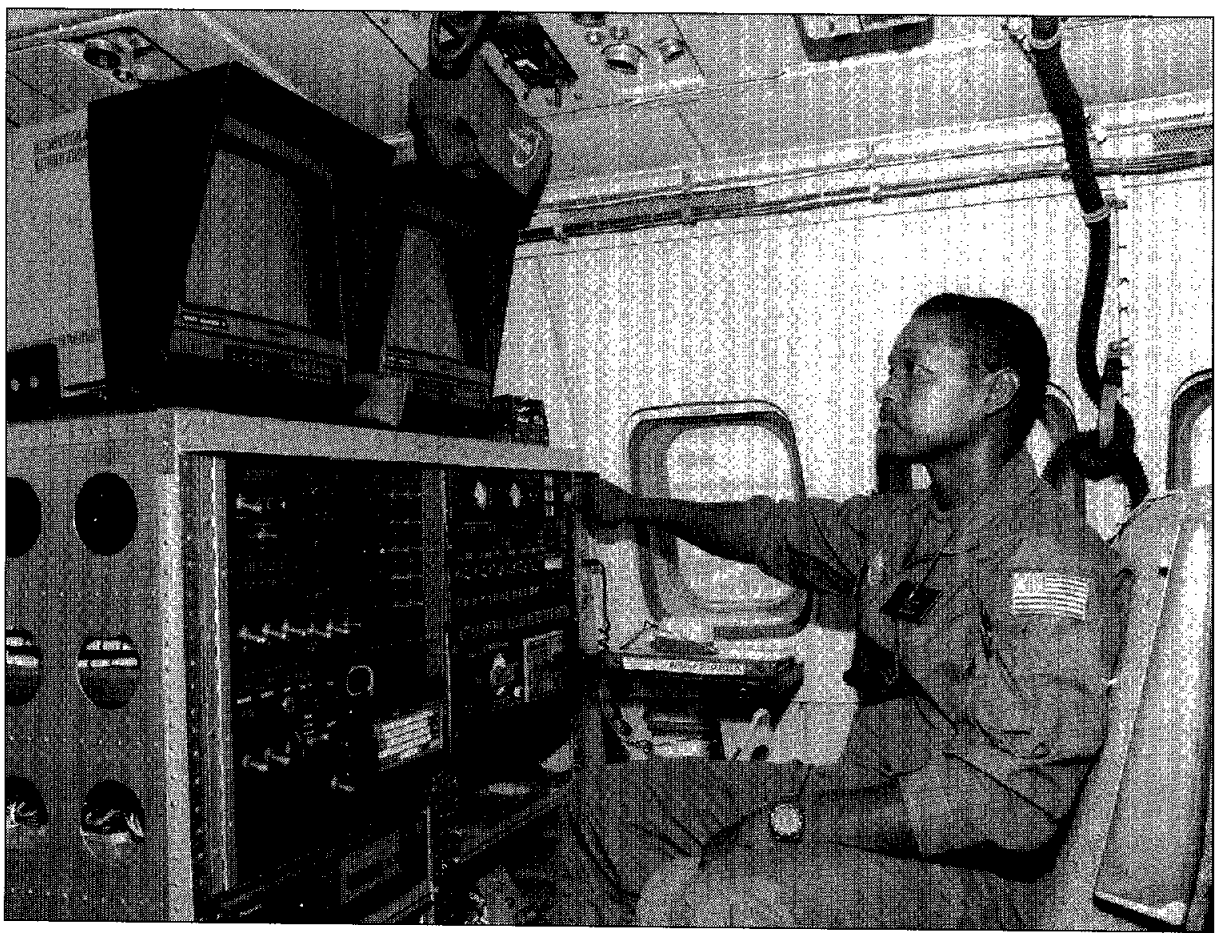
'80 Bethany pop-up camper, sleeps 6, stove, ice box, sink, water storage and accessories, $1,095 OBO. 482-7181.





Above: Carlisle Campbell, left, subsystem manager in the Structures and Mechanics Division, Hal Loden, program manager for aircraft, and Karl Schaefer of the Space Shuttle Program Operations Assessment Office inspect the LSRA tire recently tested at Edwards Air Force Base in the STS-30 landing profile. The LSRA Convair 990 stopped at Ellington Field en-route to KSC. Right: Leo Lett, far right, aircraft crew chief at Dryden, explains the LSRA hydraulic actuator that applies vertical loads to the test tire for Chuck Pace of the Shuttle Program Office, rear left, and Herb Sherwin of Martin Marietta. The hydraulic system pushes the test wheel down to simulate the effects of a shuttle landing. A yaw acuator steers the test pallet to mimic crosswinds. Bottom: Lett sits at the video console that controls LSRA cameras and records test data.

JSC Photos



Wheel stop

Converted Convair 990 becomes top simulator for shuttle tire wear tests

By James Hartsfield

A modified Convair 990 aircraft, saved from the scrap pile and "retreaded," so to speak, into the most realistic test facility available for studying tire wear, begins a series of test runs that can lead to a better understanding of shuttle tire wear and tear.

Although the Landing Systems Research Aircraft has been designed with studies of shuttle landings in mind, it also may serve as a valuable testbed for commercial aircraft tires as well. The LSRA has been a project that spanned four NASA centers—JSC, Kennedy Space Center, Ames-Dryden Flight Research Facility and Langley Research Center—and more than three years of work, said Hal Loden, program manager for the aircraft at JSC.

"We needed to be able to come up with a facility that would more closely duplicate the real world," Loden explained.

Current tire tests are performed in two facilities, a dynamometer, basically a spinning steel drum on which a test tire rolls, and a tire test track at the Langley Research Center. But both systems have drawbacks, Loden said.

"The Langley test track can only simulate loads on the tire of up to about 70,000 pounds," he said, much less than induced by a 230,000-pound orbiter. The track also is limited in its length, and a full-duration shuttle rollout cannot be imitated in a single test. Langley's facility also cannot imitate steering actions imparted to the nose wheel to counteract crosswinds during landing, Loden added.

One of the main drawbacks of a dynamometer is that the steel drum on which the tire rolls becomes hotter as a result of friction during the test, and since heat is a large factor in tire wear, the test results can be an inaccurate representation of the tire's capabilities on a regular runway.

The most accurate method for studying tire wear have been Detailed Test Objectives during shuttle flights. DTOs may call for landing with a certain amount of crosswind and applying specific amounts of steering and braking during rollout. But these real-time tests are difficult to obtain.

"Mother Nature doesn't always cooperate," Loden explained. "We wanted to duplicate the real world without having to do a DTO every time the orbiter lands."

Thus the idea for an LSRA was born and took form in late 1990 when a scrapped Convair 990 found new life with modification work beginning in-house at Dryden. A large part of the central underside of the aircraft was cut away and a test fixture capable of imparting 150,000 pounds of force on a tire was installed.

The work require was the most extensive aircraft modifications ever done there, said Leo Lett, chief for the LSRA at Dryden.

"We call the truss structure that we installed the 'Brooklyn Bridge,'" Lett said. "We had to put more than 5,500 pounds of iron inside the fuselage."

More than 60 percent of the metal used was fabricated in Dryden's in-house shop. The portion of the central fuselage that now holds the test gear previously held the 990's fuel tank, requiring an extensive fuel system modification as well.

"And the hydraulics were an experiment in itself," Lett added. The hydraulics, a 5,000 psi system which imparts the exact loads required for a specific test and also can turn the tire to imitate shuttle steering actions, amounted to more than 9,900 pounds of equipment installed in the airplane's rear cargo bay.

Pallets holding 48 nitrogen bottles, 24 in the forward cargo bay and 24 in the aft, supply the hydraulics. The LSRA also has a water suppression system, which can spray water to cool the 990's landing gear tires and the test fixture from two 100-gallon tanks mounted in the forward fuselage.

Just aft of the cockpit, a data processing rack, instrumentation rack and control console can monitor and record data from the test. Telemetry data is recorded onboard the aircraft as well as sent real time to remote stations. A high-speed film camera and a video camera are mounted in front of the test gear with video cameras on each side of the test gear.

The Shuttle Program's Operation Integration Office at JSC manages the project. Much of the equipment required for the test fixture was supplied by KSC. Engineers at Langley supplied their test expertise gleaned from the tire test track there. The modifications were performed at Dryden, and the aircraft is flown by Dryden test pilot Gordon Fullerton.

The setup allows the aircraft to exactly mimic the wear and tear endured by the shuttle tires under almost any landing conditions, Loden said. The maximum test speed is 225 knots, faster than the normal Convair 990 landing speed, and the hydraulic system can impart loads on the test tire of up to 150,000 pounds. In addition, it can turn the tire to simulate steering. And the tests can be performed on the actual runways used for shuttle landings.

Currently, the LSRA is at KSC performing a series of test runs on the Shuttle Landing Facility to verify its test procedures and provide a baseline for upcoming wear limit tests. For those runs, the tests will precisely simulate the exact conditions—loads, speeds, steering, distance and runway—experienced and recorded from past shuttle landings. The tire wear will be compared with the tire wear recorded on those shuttle landings to verify the tests. The tests also will allow a comparison with data gathered on the Langley test track.

For a test, the Convair's gear touches down and the pilot follows a digital display from the control systems onboard to ensure that the aircraft's speed is correct. The test tire, then, is lowered to touch down on the runway. The hydraulics allow the loads placed on the test tire to be precisely controlled so the high force seen briefly at touchdown as well as the forces during rollout can be simulated. The digital speed readouts in the cockpit allow the pilot to brake the 990 in exact accordance with the slowing seen during a shuttle rollout.

The next series of tests at KSC will move to measuring tire wear under various conditions, including increased steering due to crosswinds of 15 knots, 20 knots and perhaps 25 knots to explore the safe limits for the tires. Landings on a wet runway are planned as well.

Following the KSC tests, the LSRA will return to Dryden, where another series of tests will analyze nose landing gear strut failure modes, low tire pressure landings and main landing gear strut failures.

But the LSRA is expected to have more benefits than just providing a safer, more accurate characterization of the shuttle's tires. The modified Convair may be the perfect test facility for commercial aircraft and military aircraft tire manufacturers to use in characterizing the wear limits on their tires.

"It is really the most accurate test facility for aircraft tires that exists," Loden said. ❑

Vaughn becomes engineering deputy

Chet Vaughn recently was named deputy director of the Engineering Directorate by Acting Engineering Director Leonard Nicholson.

Vaughn joined NASA in 1955 and moved to the Manned Spacecraft Center in 1961 as part of the Space Task Group. He has been chief of the Propulsion and Power Division and in 1991 completed a one-year tour of duty in Washington as chief engineer for the Office of Space Flight.

Vaughn is also this year's recipient of the Robert B. Gilruth Award for outstanding leadership.

The award is presented by the North Galveston County Chamber of Commerce to recognize individual dedication within the space community.

JSC

People

Brasher named as chief

Warren Brasher was recently named as chief of the Propulsion and Power Division by Acting Engineering Director Leonard Nicholson.

Brasher joined the Manned Spacecraft Center in 1966 working in various technical and management positions in the Propulsion and Power Division. In 1986 Brasher joined the Advanced Programs Office and has served most recently as assistant to the director of engineering for the Space Shuttle Program.

Bockting award to Hailey

Dorothy Hailey has recently received the Marilyn J. Bockting award for secretarial excellence.

Hailey, secretary to the deputy manager of work package two in the Space Station Projects Office, has "significantly contributed to the organization effort to gain control of complex management and technical problems," according to the award nomination.

Vaughn Brasher Hailey Bates

Bates gets alumni honors

James Bates, flight integration manager for STS-61, was inducted recently into the Southwestern Oklahoma State University Alumni Hall of Fame.

Bates received a bachelor of science degree in physics and mathematics from the university in 1962 and began work as a Mercury flight controller the same year. He also was a flight controller during the Gemini program, and managed science operations of the five Apollo Lunar Surface Experiment packages, as well as managing two experiments flown on the Apollo-Soyuz mission.

Managers to become eligible for regular step increases

(Continued from Page 1)

Human Resources Special Projects Manager Ted Boyes.

The most popular feature of PMRS, which has governed the salaries, raises and bonuses of managers in the GM13-15 range since 1981, was its bonus system. Termination of PMRS means those one-time annual awards based on employee performance are no longer required by law. However, some form of replacement is expected to go into effect with a new system., Boyes said.

"In the meantime, performance awards for 1993 have already been paid. For 1994, current GM employees will become eligible for agency PMS awards just like GS employees, subject to budget limitations," he added

Current GM employees will remain GM with their current "off step" salaries until they are promoted, demoted, experience a three-day break in service, transfer to another agency or are reassigned to a non-supervisory, non-management position. When any of these things occur, they will convert to general schedule and their salaries will be adjusted to a GS step equal or higher than their current salary.

Current GS employees moving into supervisory positions will remain GS and stay on the GS 10-step pay scale.

GM employees will become eligible for regular step increases with waiting periods and step values equal to GS employees The waiting periods for most began with the last merit increase on Oct. 3.

Current GM employees will be able to keep their performance plans for this year, and any changes in format will be implemented before the 1995 rating period.

In addition, if JSC decides to reinstate quality step increases, current GM employees will be eligible once again.

For more details, employees are urged to call their Human Resources representatives.

JSC photo by Benny Benavides

POLICE PRESENCE — The Security Division's Joe Olivarez staffs a booth exhibiting security hardware used by JSC officers. Precinct 8 Constable Bill Bailey, holding box, discusses the hardware with Olivarez during last weeks Security Fair. Next to Bailey is Deer Park Police Lieutenant Stan Shafer, son of Security Division Chief Everett Shafer. Visitors to the fair saw a variety of law enforcement tools including the Houston SWAT team's armored personnel carrier and the Customs Department's Blackhawk helicopter. The four winners of the security slogan contest were also announced.They are Claire Cox, Nancy Howski, A.J. Alfonzo, and Sherie Cooper.

First Apollo flight salute tomorrow

The 25th anniversary of the Apollo era's first human space flight, Apollo 7, will be remembered tomorrow evening with a special program and buffet dinner at Space Center Houston.

Apollo astronaut Gene Cernan will be master of ceremonies for a presentation that will include Apollo 7 astronauts Wally Schirra and Walt Cunningham beginning at 7 p.m.

Tickets are $15.50 per person and are available at the Space Center Houston ticket window and the JSC Exchange Store in Bldg. 11

For more information contact Spaceweek National Headquarter at 333-3627

Space News Roundup

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

Editor .....Kelly Humphries
Associate Editor .....Kari Fluegel

Loral chosen as aircraft simulation contractor

JSC will begin final negotiation with Loral Space Information Systems Inc., for the Aircraft Simulation and Information Contract worth approximately $35 million over five years.

The contract, beginning Jan. 1, is a continuation of the engineering and technical effort that Loral is currently performing.

The contracted work, to be performed at JSC Ellington Field, supports the JSC Aircraft Operations Division of the Flight Crew Operations Directorate. These services include engineering and technical support for astronaut training in a high fidelity airborne simulation of the shuttle landing phase and information systems support to the division's local area networks and data bases.

Support will be required for shuttle training aircraft deployed in shuttle launch, landing and field training operations at White Sands Test Facility, Edwards Air Force Base and the Kennedy Space Center.

The five-year period of performance will be divided into a two-year base contract period and three one-year options.

SLS-2 data is "amazing"

(Continued from Page 1)

will be made of various crew members' heart structures during the flight with a state-of-the-art imaging system. Readings also will be taken of crew members while exercising.

Other experiments concentrated on how the body's motion-sensing organ in the inner ear, called the otolith, reacts to the loss of gravity. During the week, crew members donned a cap fitted with motion sensors and recorded any space motion sickness symptoms so investigators could study the relationship between natural and exaggerated head movements and periods of discomfort.

Other sensory-motor adaptation experiments were conducted. On Earth, when stationary people see an object move, they momentarily feel as if they are moving, too. On *Columbia*, crew members stare at a rotating dome covered with colored dots and use a joystick to indicate the perceived direction and speed of rotation.

"The difference between the data on Earth and the data in space is absolutely amazing," Commander Blaha told ground-based researchers as Fettman took the first turn at the position awareness experiment. Fettman and other crew members use a light pen to point at a target on a wall grid, first with their eyes open and then with them closed. Scientists hope to determine how the senses which help identify body position on the ground are adversely affected in the absence of gravity.

And the crew enjoyed a little "bungee jumping" in the name of science by putting on a harness outfitted with bungee cords designed to mimic the sensation of falling. Electrodes measure if the astronaut's muscles send a signal to "catch oneself" when sensing a fall as they do on Earth.

The crew also had some time to relax and chat with students and ham radio operators in the United States and France. And Pilot Searfoss sent birthday greetings to his daughter Elizabeth who turned eight years old last week.

Columbia's systems have functioned very well thus far. The crew needed to troubleshoot a small waste water leak around the waste collection system's bacterial odor filter.

The longest shuttle mission to date is scheduled to conclude next Monday at 9:22 a.m. CDT when *Columbia* lands at Edwards Air Force Base.

ASRM termination plans due Nov. 1 from centers

(Continued from Page 1)

About 3,600 contractors currently work on the program. Lockheed Space and Missile Co. is the prime contractor for the ASRM. The number of actual job terminations required as a result of this action will be determined by the individual contractors and subcontractors working on the program.

The ASRM program is managed by the NASA Marshall Space Flight Center. Fabrication of the motor was to be accomplished at facilities under construction in Iuka, Mississippi. Additional facilities for the qualification testing of the motors were under construction at the Stennis Space Center.

The motor, which would replace the Redesigned Solid Rocket Boosters used to launch the space shuttle, was started in June 1990. Its projected development cost was $3.8 billion, and its first flight was scheduled for December 2000.

PILOT gets shuttle test flight

(Continued from Page 1)

mance levels on PILOT which will be compared to their on-orbit performance. Blaha will fly PILOT at mid-flight, immediately prior to re-entry equipment stowage, and again after landing during crew transport. Searfoss has flown more than 700 approaches on PILOT and will fly the simulator at the mid-point of the flight, close to the end of flight and more often if time allows. Detailed Test Objective Manager Charlie Justiz, a research pilot at Ellington Field, says "we want Blaha to fly PILOT as quickly as possible after landing because we don't know how quickly people readapt to a 1-g environment."

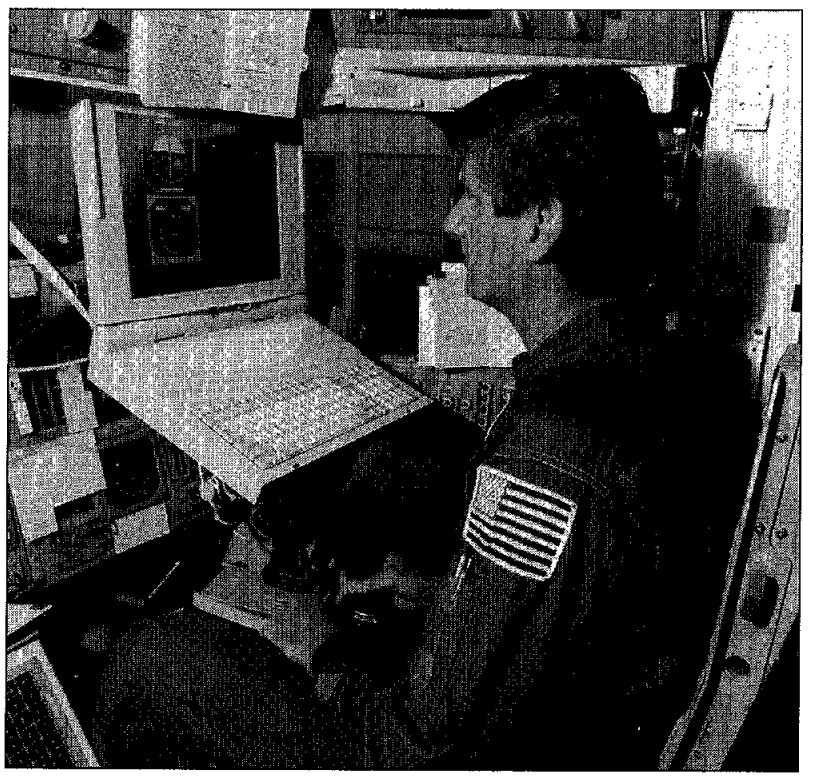
Following its initial test flight on STS-58, PILOT is manifested on six upcoming shuttle missions for additional validation testing. PILOT will have limited exposure on STS-58 and STS-61, but use frequency will be built up during subsequent test flights. Justiz anticipates that in future tests either the commander or the pilot would be tasked with flying PILOT daily. The other would fly the simulator one time just prior to landing to help "determine the best method of using PILOT as a training tool," said Justiz.

In addition to acquiring information on the on-orbit performance of shuttle pilots, the simulator itself will be under scrutiny. "We are testing several things with this mission," says Justiz, "not just the adaptation of pilot and commander on orbit, but also how well the computer system will stand up to the environment in space which can be very hostile."

Former astronaut and co-principle investigator Joe Engle initially presented the PILOT concept to NASA Office of Space Flight Associate Administrator Jemeriah Pearson last August.

"PILOT was developed in record time" says Justiz. "From General Pearson's approval of the project, through design and procurement, to production of a working flight model, took only nine months." Justiz credits the hard work of the PILOT team with that success.

Team members included Justiz and Engle; Al Strahan and Bill Overton; Pat Wilson, Dirk Johnson, John Fwu, Bob Hinson, Rocky Smith, Jim Brock, Dave Jossi, and Don Hannsz.



JSC Photo by Mark Sowa

Charlie Justiz demonstrates PILOT in the full flight trainer fuselage. The simulator is being used on board Columbia by Commander John Blaha and Pilot Rick Searfoss to measure the effects of microgravity on pilot's performance levels. PILOT is secured in front of the pilot's seat and displays either a heads-up display or instrument panel readout.

NASA-JSC