

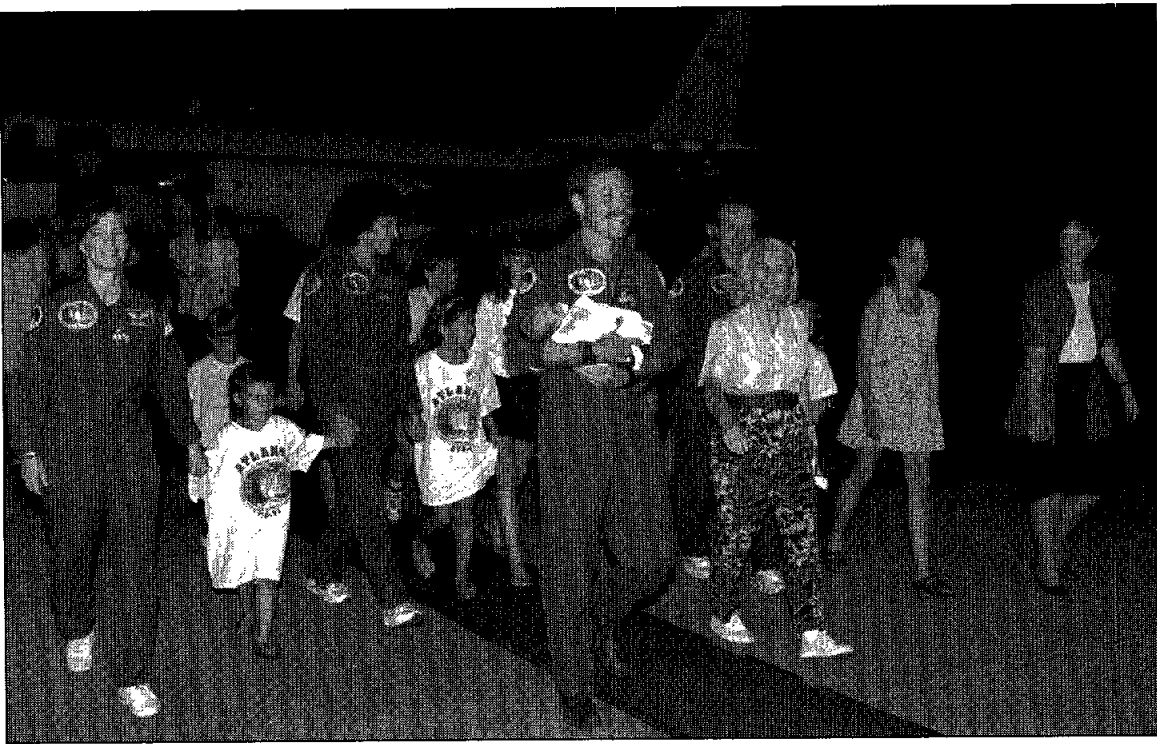


Space News Roundup

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No. 28



JSC Photo by Mark Sowa

STS-71 Commander Hoot Gibson returns home to his new daughter at Ellington Field. Gibson and his fellow crewmates, Pilot Charlie Precourt and Mission Specialists Greg Harbaugh, Bonnie Dunbar and Ellen Baker returned after the successful docking of the shuttle *Atlantis* with the Russian *Mir* Space Station.

Atlantis brings Norm home

By Karen Schmidt

A welcome home to be longed remembered. "A new era in space flight has begun," said Astronaut Curt Brown from Mission Control in Houston when *Atlantis* stopped on runway 33 at Kennedy Space Center.

The STS-71 and *Mir* 18 crew members were greeted with a phone call from President Bill Clinton and handshakes from NASA Administrator Daniel S. Goldin and the Director General of the Russian Space Agency Yuri Koptev.

"We all watched you with absolute fascination and incredible support and enthusiasm," said President Clinton. "This is truly the beginning of a new era of cooperation in space between the United States and Russia. And I think because of your mission, now the United States and Russia, with our partners in Canada and Japan and Europe, are going to be able to meet the challenge of building the International Space Station. The next time we have any problems between American and Russian officials, I'm going to send them into space. I think I now know how to solve all international problems."

Goldin and Koptev greeted the crew at the runway to congratulate them on their successful mission.

On their return to Ellington field, the crew were greeted by family members, fellow workers and music from Scottish bagpipes.

Gibson heaped praise upon his crew and all of the ground support.

"Even today, nearly 20 years after we first rolled out the space shuttle, I am still amazed at its capability and what it can accomplish," Gibson said. "I am extremely proud of this crew. They made it look easy."

Pilot Charlie Precourt said while on orbit the crew kept questioning each other and were astonished at what they accomplished.

"It is an amazing thing to be a part of something like this. They say a chain is only as strong as its weakest link and I've been thinking back to try to find where that weak link is and I can't find one," Precourt said.

Mission Specialist Ellen Baker said the team of folks at NASA made the mission such a success.

"Certainly that is NASA's strongest assets. It's the team of folks we have working, training us here," Baker said. "The memory of the people and the new friendships is what is most precious to me."

Harbaugh agreed with Baker that the training teams made the mission a success. He especially thanked

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STS-70 flight brings new tools on-line

Discovery's launch on STS-70 will bring telecommunications and shuttle hardware to new levels with deployment of another Tracking and Data Relay Satellite, the first flight of a new Block 1 engine and the first use of a new state-of-the-art Mission Control Center.

Commander Tom Henricks, Pilot Kevin Kregel, Mission Specialists Don Thomas, Nancy Currie and Mary Ellen Weber are scheduled to deploy TDRSS with its attached Inertial Upper Stage from *Discovery's* cargo bay six hours after launch. The IUS, consisting of two solid rocket motors, will help the satellite reach its geosynchronous orbit. Once in its proper orbit the IUS will separate from the satellite and deployment of the satellites appendages will begin.

TDRSS will not only improve communications for shuttle missions but enhance data acquisition from several other space customers including the Hubble Space Telescope, the Compton Gamma Ray Observatory, the Extreme Research Satellite, the Upper Atmosphere Research Satellite, TOPEX-POSEIDON and others.

The new Block 1 engine that is on its maiden voyage is designed to increase the crew's safety during launch and improve performance and reliability. The new high pressure liquid oxidizer turbopump located inside the Block 1 engine has 300 fewer welds than the existing pump. The new pump also will last longer before detailed inspections must be done. The old pump is removed after every flight for inspection, the new one only after 10 flights.

With deployment of the satellite complete, the crew will settle down

to seven days of research. Experiments aboard *Discovery* will look at the effects of microgravity on plants, small invertebrate animals and insects. The Bioreactor Development System, developed at JSC, will grow individual cells into tissue. Other experiments include protein crystal growth and several experiments of bone and muscle development. The crew is expected to conduct Shuttle Amateur Radio Experiments with several schools around the U.S. and a school in Argentina.

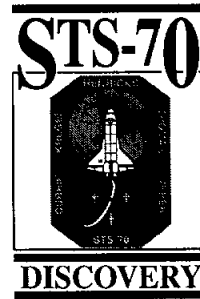
STS-70 also will be the first shuttle flight in which ground support will use the new Mission Control Center.

The first flight in the new control center will mark the beginning of the end for the current Mission Control. The current facility will begin a gradual phasing-out period and next year will be relinquished to history as a national monument. The first flight from the new center will usher in a drastic change in the tools and costs associated with human space flight control.

The new control center eliminates the NASA-unique equipment and massive hardware orientation of the current Mission Control, replacing it with a modular, software-oriented design that uses standard, commercially available equipment.

"The original Mission Control was a technological wonder of the world when it was built. Nothing like it had ever existed before. It was the first of its kind," said John Muratore, chief of JSC's Control Center Systems Division. "The new Mission Control is a milestone in the way we are putting together today's common,

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NASA/FAA announces aviation design competition

NASA and the FAA are sponsoring a General Aviation Design Competition for students at U.S. aeronautical and engineering universities to address design challenges for general aviation aircraft and related systems.

The competition, in its second year, allows students working with faculty to participate in an effort to develop technologies for a small aircraft transportation system. The competition also is intended to help raise student awareness of the economic relevance of general aviation and its value for

business and personal use. NASA and the FAA want to increase the involvement of the academic community in the revitalization of the U.S. general aviation industry while providing real-world design and development opportunities for students.

Student teams will be challenged to develop system designs in one of the following technical areas, integrated cockpit systems; propulsion; integrated design and manufacturing; aerodynamics and operating infrastructure. Design packages will be reviewed by

industry and government experts who will provide feedback.

Design packages are due by May 6, 1996. An award of \$5,000 will be given to the university academic department of the first place winner, with \$3,000, \$2,000 and \$1,000 awards respectively given to the second, third and fourth place design teams.

Winners will be presented with their awards at the annual Experimental Aircraft Association Fly-In Convention and Sport Aviation Exhibition in July 1996.

The competition was created in response to NASA Administrator Daniel S. Goldin's challenge to tap engineering talent within universities and FAA Administrator David Hinson's policy supporting aviation innovation. The competition is being coordinated by the Virginia Space Grant Consortium, a nonprofit aerospace educational coalition.

General aviation has proven to be an important contributor to the economic well-being of the U.S. Presently, the 212,000 general aviation

aircraft in service comprise 62 percent of all U.S. flight hours, 37 percent of all flight miles, and 78 percent of all departures in our country. General aviation provides 540,000 U.S. jobs and \$40 billion of economic input annually. The U.S. general aviation industry, however, has declined steadily over the past 15 years. In 1978, a record number of 18,000 new general aviation aircraft were delivered by U.S. manufacturers. Only 800 deliveries of new general aviation aircraft were recorded last year.

JSC software tools find business market

By James Hartsfield

NASA software that was developed as a tool to assist in updating older programs written in older languages, such as FORTRAN, to more modern computer languages, such as C++, will be further enhanced and made available to private industry through a recently signed agreement between ReSoft, Inc. of Houston.

The Space Act Agreement will benefit NASA by providing a lower cost for enhancements to the software tools while simultaneously transferring publicly developed technology to private industry.

The programming tools, called the Reengineering Applications tools, were developed and extensively used in the 1970s and 1980s to assist in maintaining programs used by NASA in planning the trajectories of shuttle missions, said Charles Pitman, a computer engineer in the Technology Systems Division. Later, the REAP tools were further developed for use in modernizing FORTRAN software to Ada software. More recently, improvements to REAP have focused on providing a graphical user interface and modernizing FORTRAN to C and to object-oriented C++.

"They provide great assistance in reengineering older software to more modern languages," Pitman said.

ReSoft plans to further develop REAP and incorporate it as part of a commercially available Software Reengineering Toolkit. The SRT will provide software engineers with tools to use in reengineering applications to be better structured, better documented, less costly to maintain and more thoroughly tested, said Charles B. Hoffman, ReSoft president.

"The SRT will be highly versatile and can

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From left are Bob Hennis, Hank Davis and Chuck Hoffman signing the Re-soft Space Act Agreement.

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.

Justin World Bullriding Championship: 7:30 p.m. at the Summit. Tickets cost \$10 for Aug. 18, \$15 for Aug. 19 and \$18 for Aug. 20.

Grand Casino Couthatta: Bus trip departs JSC at 6:30 a.m. Aug. 6. Tickets cost \$5.

Country and Western Dinner/Dance: 7:30 p.m. July 29 at the Gilruth Center. Tickets cost \$12.

Schlitterbahn: Tickets cost \$17.80 for adults and \$15.30 for children 3-11.

Sea World: Tickets cost \$23.50 for adults and \$16.25 for children 3-11.

Six Flags: Tickets cost \$23.70 for a one day pass, \$31.75 for two day pass and \$20.30 supersaver not valid on weekends in June July and August.

Astroworld: Tickets cost \$18.10.

Splashtown: Tickets cost \$11.05.

Fiesta Texas: Tickets cost \$20.35 for adults and \$15.80 for children 4-11 and seniors over 55.

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.

Metro tickets: Passes, books and single tickets available.

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

Stamps: Book of 20, \$6.40.

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

Upcoming Events: Sam Houston Raceway Park discount packages available soon.

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.

Softball: Registration for Mixed B is July 20, Mixed C is July 18, Mens A July 21, Mens B is July 20, Mens C is July 19 and Men over 40 July 21.

Weight safety: Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. July 12 and July 27. Pre-registration is required. Cost is \$5.

Softball tournament: Men's open tournament July 22-23. Cost is \$100. Entry deadline is July 19.

Defensive driving: Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is Aug. 5. Cost is \$19.

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

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

Aikido: Martial arts class meets from 5-7 p.m. Tuesdays and Wednesdays. Cost is \$25 per month. New classes begin the first of each month.

Ballroom dancing: Cost is \$60 per couple. For additional information call the Gilruth Center at x33345.

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

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Dates & Data

Today

Cafeteria menu — Special: baked meatloaf. Total Health: baked potato. Entrees: chicken fajitas, ham steak, pork and beef eggrolls, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: stewed tomatoes, seasoned spinach, cut corn, macaroni and cheese.

Saturday

Lunar run: The Loral Lunar Rendezvous Run will be held beginning at 8 a.m. July 15 at the Gilruth Center. Entry to the 5K run or 2-mile walk is \$12. Participants receive t-shirts, refreshments and be eligible for door prizes. Applications are available at the Gilruth Center. For more information call Dennis Halpin at x36093.

Monday

Spaceweek lectures: The Galveston Bay Section of the Institute of Electrical Engineers will host a noon-time seminar "Magellan Looks at Venus," in the Teague Auditorium. Walter Kiefer of the Lunar and Planetary Institute will be the featured speaker. For more information call Cliff Mason at 335-6897.

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

Tuesday

Spaceweek lectures: The Galveston Bay Section of the Institute of Electrical Engineers will host a noon-time seminar on the "International Space Station," in the Teague Auditorium. For more information call Cliff Mason at 335-6897.

Health seminar: The JSC clinic is sponsoring a one hour seminar beginning at 11 a.m. July 19 in the Teague Auditorium. Dr. Andrew Jackson of the Department of Health and Human

Performance at the University of Houston will discuss "Exercise, good health and aging." For more information call the clinic at x34111.

NAT meets: The National Technical Association will meet at 6:30 p.m. July 18 at Texas Southern University School of Technology Rm. 316. For more information call Carrington Stewart at x31404.

SIA dinner: The Spaceweek International Association will host a dinner in honor of the Apollo-Soyuz crews beginning at 7 p.m. July 18 at the South Shore Harbour Hotel and Conference Center. Tickets cost \$50. For more information call Susan Davis at 333-3627.

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

Wednesday

Spaceweek lectures: The Galveston Bay Section of the Institute of Electrical Engineers will host a noon-time seminar on "Russian Cooperation in the International Space Station," in the Teague Auditorium. Featured speaker is James Nise of the Russian Program Office. For more information call Cliff Mason at 335-6897.

NTA conference: The National Technical Association will hold its annual conference July 19-22 at the Westin Galleria Hotel. NASA Administrator Daniel S. Goldin will discuss "Global Information Space and Education." For more information call Teresa Williams at x38509.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon July 19 in Bldg. 31, Rm. 129 An open discussion meeting is planned. For more information, call Al Jackson at 333-7679.

Toastmasters meet: The Space-

land Toastmasters will meet at 7 a.m. July 19 at House of Prayer Lutheran Church on Bay Area Blvd. For information, contact Elaine Trainor, x31034.

Cycle club: The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. July 19 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

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

Thursday

Spaceweek lectures: The Galveston Bay Section of the Institute of Electrical Engineers will host a noon-time seminar on "New Results from Clementine," in the Teague Auditorium. Feature Speaker is Jeff Gillis of the Lunar and Planetary Institute. For information call Cliff Mason at 335-6897.

Cafeteria menu — Special: chicken fried steak. Total Health: baked potato. Entrees: beef tacos, steamed pollock, baked chicken, catfish special. Soup: navy bean. Vegetables: spinach, cut corn, breaded okra, pinto beans.

Friday

Spaceweek lectures: The Galveston Bay Section of the Institute of Electrical Engineers will host a noon-time seminar on "Shuttle/Mir Docking," in the Teague Auditorium. STS-71 Flight Director Bob Castle is the featured speaker. For more information call Cliff Mason at 335-6897.

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

Swap Shop

Property

Sale: Webster condo, 2-2-2CP, FPL, ceiling fans, mini blinds, new dish washer, refrigerator, W/D conn, \$39.9k. x47513 or 280-0285.

Sale: Friendswood, Regency Estates, 3-2-2, new carpet/roof/paint, \$84.5k. 864-1037.

Lease: Friendswood/Pearland area, 3-2-2, FPL, lg yard, cathedral ceilings, \$625/mo. 922-5447.

Lease: Pipers Meadow, nice clean house, 3-2A, fenced, all brick, ceiling fans, hi-efficiency A/C, \$760/mo. 486-0315.

Rent: Friendswood, both formals, den, FPL, screened porch, Jen-Air kitchen, \$900/mo + dep. Mark, 282-5271.

Rent: Galveston condo, furnished, sleeps 6, Seawall Blvd & 61st St, cable TV, wknd/wkly/dly. Magdi Yassa, 333-4760 or 486-0788.

Rent: Pasadena, Bayshore Town Homes, 1 BR, \$350/mo. 992-3662.

Rent/Sale: Waterfront condo 201A on Lake Livingston at Cape Royale in Coldspring, sleeps 6, 2-2, fully equipped, wknd/wkly/dly rates. Barbara, 337-1494 or 1-800-367-2256.

Sale: wooded lot, 1+ acres, Tomball area, deed restricted subdivision, paved streets, elect, water, \$9k. 333-4609.

Sale: Egret Bay condo, 2-1-2CP, FPL, W/D, CF, D/W, micro, refrig, boat launch, new carpet/tile, \$45k. x41036 or 333-4577.

Sale: Clear Lake Forest, 4-2.5-2, glass walled den w/hi ceiling, FPL, formals, family room, new roof/paint/carpet/paper. 333-5300 or 326-2307.

Rent: BayWind II condo, 2-2, split plan, FPL, W/D, \$585/mo. Pete, x38614 or 480-4028.

Cars & Trucks

'91 Subaru Legacy, auto, FWD, fully loaded, great cond, 62k mi, \$8.1k. Ian, x34853.

'89 Sidekick Jeep, FWD, auto, 70k mi, A/C, red, \$5k obo. Kerry or Anoinette, 437-2731.

'74 VW Thing, white, new engine/battery, good tires, \$3k obo. Dick, 335-6842 or 286-4444.

'86 Dodge Colt, htc/bk, white, A/C, 92k mi, looks/runs good, \$1.2k obo. x31192 or 286-5910.

'90 Mazda RX-7 GTU, 5 spd, 67k mi, sunroof, red, \$9.2k. x36463 or x34407.

'82 Nissan 280 ZX, T-tops, 5 spd, PS/PW/PL, A/C, runs great, \$1.4. x30127 or 331-4628.

'86 Mercedes 190E 2.3 cabernet, auto, sunroof, 131k mi, maintenance records, good cond, \$7k. Polly, x48928 or 337-5392.

'78 Porsche 924, orig owner, good cond, 5k mi on rebuilt engine, A/C, sunroof, \$3k obo. John, x49816 or 486-0097.

'93 Ford Taurus GL, ex cond, pwr, 38k mi, tinted windows, extend warr, \$10.k obo. x37113 or 286-3019.

'91 Nissan Pathfinder SE, FWD, blue, loaded, new tires/brakes, 75k mi, \$15k. 474-5107.

'92 Mazda Miata, red/black, PS/PW, A/C, cruise, AM/FM/cass, CD changer, 29k mi, ex cond, \$15.8k. James, x31064 or 334-1766.

Boats & Planes

'88 Invader, 210 cuddy cabin, I/O 200Hp Merc, galv trailer, loaded, great condition. 997-6141.

Laser 2 sailboat w/trailer, spinnaker rigged, trap, vest, \$1k obo. x41095 or 486-8185.

Audiovisual & Computers

AIWA #AXR-004 stereo audio/video recvr w/remote, \$120/obo; Sony CD player w/full remote, \$75 obo; Sanyo VHR 9370 dbl azimuth, 4-head, VHS VCR w/remote, needs service, \$35 obo; MTX 5-way 250 watt, 15" woofer, home spkr, 4 Ohm, \$150 obo; Pioneer KEHM-5500 detach face full function cass player w/CD changer controller; Pioneer CD/M30 6-disc CD changer, \$225/set will sell sep. Lisa, x40213 or 554-4140.

Citizen printer "CSX-140" w/GSX color option, \$199. Magdi Yassa, 333-4760 or 486-0788.

Brother Word Processor, ex cond, \$100. Frank, x33569 or 992-3515.

Word Perfect version 6.1, Compaq disk CD ROM version for Windows, \$125 obo. Bert, x47512 or 488-0264.

386DX40, 4 Mb RAM, 170 Mb HD, \$450; 486DX40, 8 Mb RAM, 420 Mb HD, \$750; both have 3.5 & 5.25 HD FD, SVGA video, 28 DP monitor & mouse. Charles, x36422 or 280-9650.

386SX computer, 2 Mb RAM, 40 MB HD, color monitor, \$300. x36185 or 286-1726.

Commodore 64 kybd, disc drive, joysticks, modem, asst software, \$100 obo. 339-2056 or 282-4078.

Panasonic KX-P1624, 24 pin multimode impact dot matrix printer, ex cond, \$80. 488-8415.

Apple IIc, 2 5.25 FD, mono monitor, mouse, joystick, software, carry case, TV adapter, \$100. 280-7545 or 486-4613.

386DX 40 MHz, 350 Mb HD, 4 Mb RAM dbl spd CD ROM, 3.5 & 5.25 FD, 18.4 ext modem, 4 spkr, joystick, mouse, super VGA .28 non interlace monitor, color dot matrix printer, S/W, 992-0782.

Kenwood TM441A xceiver, \$375; Kenwood TS130 SE xceiver, \$575. Bill, x36650 or 554-6242.

Color Radius Pivot/LE monitor w/PDS video card for MAC, new \$800 sell \$550. 480-3424.

Macintosh Quicken version 3.0, \$15; Compaq 286, 20 Mb HD 2 Mb, 3.5, 5.25 monitor, Windows 3.1, MS Word 2.0, \$275; 7750A auto load plotter, 8 pin, ex cond, \$400 obo, or will trade for 486DX cpu. 554-4799.

Sharp CD stereo sys, 5 CD changer, dual cass, digital tuner, remote control, \$150. 332-8188.

286 NEC computer w/NEC EGA monitor, 40 Mb HD, 5.75 FD, internal modem, kybd, S/W, \$225. 286-4255.

Paradox for Windows, \$80; Visual C++ book w/CD ROM, \$40; Paradox book w/software examples, \$60; Space Quest V, \$30; printer board, \$15. 282-3570 or 474-3820.

Mac Powerbook 540c, 4/320, color notebook, \$3.1k. x36243 or 488-8775.

IBM-PS2 model 50Z, 286 w/HD, 3.5" FD, 3 Mb

RAM, mouse, color monitor & dot matrix printer, S/W, computer desk w/hutch & chair, sell sep or \$500/all. Shane, x41022 or 992-1162.

Musical Instruments

Yamaha Coronet, \$350. Beverly, 834-2191 or 489-1172.

Peavey guitar amp, 12" spkr, distort/reverb foot sw, 60 watt effects loop, blk, \$295. Victor, 282-4625 or 481-9335.

Wurlitzer pinet piano, mahogany, \$600. 471-0778.

Pets & Livestock

Netherlands Dwarf rabbits, hutch w/water & food feeders. Rich, x47257 or 996-7630.

Ferret, neutered male, w/cage, hammock & litter box, shots, \$175 obo. 538-3425.

Black AQHA mare, has been shown, trail rides, gentle, easy keeper. 585-4101.

AKC blk Chow puppies, 5 males/1 female, 5/25/95 avail for 7/13/95. Debbie, 334-5987.

Chows 2 female, shots, \$100 ea; male, part Chow, blk, big, neutered, shots, \$50. 337-3838.

Umbrella cockatoo, 7 yr old male, hand-fed, w/cage, \$1.5k or trade for piano of comparable value. Larry, x47004 or Shirley, 930-8393.

Free kittens. 332-1725.

Sugar Gliders, 6 wk old, 4 avail; Malaysian water monitor, 3.5", tame, \$175; Mangrove monitor, 3", aggressive feeder, \$150. Brett, 333-6415 or 397-8388.

Household

Sears Kenmore upright freezer, wht, 15 cu ft, ex cond, \$285 obo. 488-8415.

Butcher block style dinette, \$100; Little Tykes high chair, \$50. x37130 or 334-4124.

Triple dresser w/mirror and matching chest of drawers, 5 drwr, dk wood, \$200. 482-0765.

Matching woodgrain couch table & sq coffee table w/glass inset, \$50. Ann, x33367.

Sect sofa w/qn sz sleeper, qn sz waterbed w/6 drwr underdresser, bookcase hdbd; dinette w/4 chairs, coffee tbl, end tbl, best offer. Len, 333-5576.

Sofa/sleeper, ex cond, burgundy w/mixed earth tones, \$200 obo. x38855 or 554-8951.

3 pcs coffee table & 2 end tables, wht w/glass. 771-3862.

bedroom furn, dk & veneer, wrap-around style, 5 pcs, dresser/corner unit/cabinet, 2 book shelves, \$125 obo. 286-4255.

Amana refrig, 24 cu ft, side-by-side, ice/water door dispensers, almond, \$495. 471-9432.

\$300. Tom, 286-7001.

Qn sz waterbed, temp control, waveless, executive side padding, 6 drawers, \$140 obo. Roger, 992-2767.

Solid wood chifferobe dresser, 41"hx41"wx17"d, 6 drawers, 2 shelves & closet pole, wht, \$150. Linda, 488-8588.

Large blue leather couch, ex cond. 326-2307.

Love seat, brown velour print, good cond. x40250 or 941-3262.

Scandinavian design twin trundle bed w/bookcase hdbd, \$120. x34535 or 554-6960.

Free Maytag dishwasher, needs timer, U-pic up. x37341 or 326-1267.

Wanted

Want female roommate for 3-2.5 townhome, non-smoker & like cats. Lisa, 286-3828.

Want carpooler from I-10 west, 290 north area to Clear Lake area, w/working hrs between 7 a.m. - 4 p.m. Racquel, x34167 or Bob, x35207.

Want personnel to join VPSI Vanpool departing Meyerland Park & Ride lot at 7:05 a.m. for JSC, on-site workers, 8 a.m. - 4:30 p.m. shift, Travis Moebs, x45765 or Don Pipkins, x35346.

Want personnel to join VPSI van pool from Sugarland & southwest Houston to NASA area. Alice, x35234.

Want nanny for 2 boys, ages 3 yrs & 3 mos, experienced, excellent references. \$24-4967.

Want old foreign 4x4 work truck, '79-'86. Joseph, 480-9468.

Want house in Heritage Park, assumable w/low equity. 480-9468.

Want sm 2 wheel open utility trailer. x31142 or 488-4415.

Want 20 sq ft of large tile. x31883.

Want STS-71, Spacelab, Mir, Microgravity & Life Sciences cloth patch or decal. Andrew, x34312 or 280-0647.

Want fancy white parakeet bird cage. 333-6724 or 482-1505.

Want private pilot needs new or slightly used headphones w/mike. 282-3570 or 474-3820.

Want pop-up camper. Howard, x37346.

Miscellaneous

Diamond pendant "V" drop, herringbone chain forming a solid arrow head w/diamonds. x49745 or 585-1031.

Sentra tire & rim, \$15; wrought iron adj height mirrored table \$30. x47182 or 486-1859.

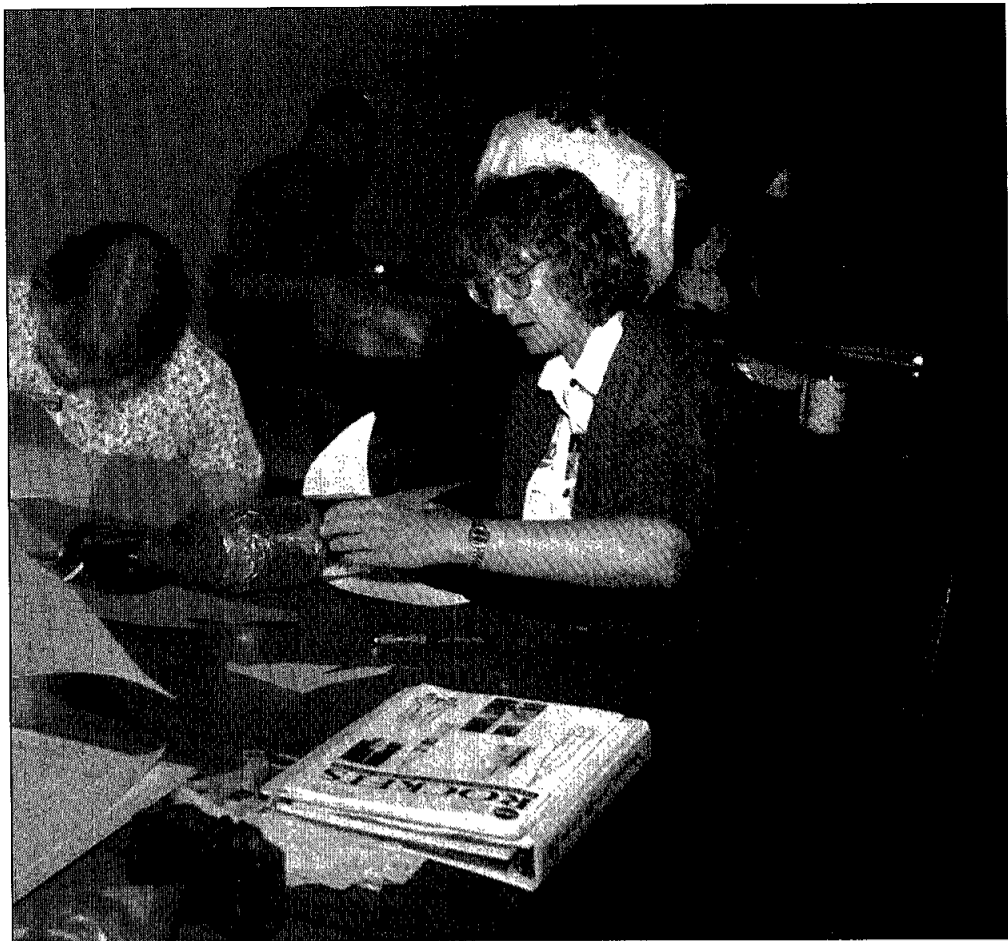
DP Airmometer stationary bike, air resistance sys & electronic monitor, handlebars move for upper body workout, \$75. Ann, x33367.

Aquarium, 45 gal, w/stand/top & light, includes assorted plants, amphibians & reptiles, \$175. Jeff, x36425 or 332-8489.

Boat anchor & chain, 20 lbs, \$20; Chevy trailer hitch, \$5; HP 12C financial calculator, \$25; lg maple desk, \$150; qn bed frame, \$13. 482-8827.

Family Education

Employee family members participate in week long JSC educator workshop



By Norma Rhoads

Civil service and contractor employees now have help to explain what they do at work since 23 of their family members attended a week long aerospace education workshop recently at JSC.

"This program has certainly rekindled my enthusiasm for the space program," said Susan Rowald, an Aldine middle school teacher and daughter-in-law of Nolan Rowald an Allied Signal employee in the Avionics Systems Division. "It has really made it more clear to me how all the disciplines are integrated into the space program as well as how applications of space technology have improved our quality of living and continue to do so."

For the third year, teachers spent a week onsite participating in variety of activities. Aerospace educator workshops offer teachers a chance to become familiar with NASA's aerospace activities, update their knowledge of current aerospace research and technology, develop new teaching strategies and network with teachers from other schools and other areas of the country. These workshops provide the teachers with the opportunity to bring the U.S. space program into their classrooms.

Some teachers came quite a distance to participate in the workshop. Meg Piatt had two reasons for coming to Houston. Her brother, flight surgeon Dr. Pat McGinnis, moved here a few years ago and no family members had yet visited. McGinnis told his sister about the workshop and extended an invitation to visit him and attend the workshop. Unfortunately, Piatt was able to spend just a few hours with her brother. She arrived Sunday evening, had the workshop all day Monday, saw her brother Monday evening and on Tuesday, McGinnis had to leave for Kennedy Space Center to support the STS-71 mission. Although there was the disappointment of not being able to spend much time with her brother, Piatt felt her experience at JSC was worth the trip.

"I learned so much about NASA and I look forward to returning again some day. My students will get a multi-media experience from all that you have given," she said.

For the first time, teachers from outside the

immediate area traveled to JSC for the workshop. In addition to local Bay Area and Houston teachers, educators from Allen, Cedar Park, San Antonio, Santa Fe and Tomball participated. Teachers came from California, Colorado, Kentucky and Oklahoma to attend the week long workshop.

The workshop is designed to "give back" to those in the community who help with center educational efforts. By helping teachers to integrate space and technology into their curricula, more students benefit with the knowledge they gain about space exploration endeavors, the results of that exploration, and the benefits.

Their days were packed—beginning at 8:30 a.m. each day and going until 5 p.m. or later. The educators, primarily elementary teachers, were shown how to incorporate aerospace into all areas of their curriculum. For instance, they participated in hands-on activities which significantly helps them in learning how to demonstrate specific concepts. Activities were chosen that were easy to duplicate in the classroom.

"It was great. It helped me understand more of the complexity involved in going on a shuttle or space flight, the intricacy of the human body and the effects of space on it and gain a better picture of the whole process from preparation to debriefing after landing," said Rita Balciunas, wife of Rudy Balciunas of the Engineering Business Management Office.

Each participant had his or her own favorite event or session during the workshop. While some thought visiting mission control, the shuttle mission simulators and robotics were among the best, others felt some of the lecture sessions or the hands-on activity sessions were most compelling. There were visits

made to labs and facilities all over the site including the food lab, tile lab, mock-ups, trainers, the Weightless Environmental Training Facility and different chambers. Lectures provided the cohesiveness between facility visits and hands-on activities. Topics for the talks included the International Space Station, space suits, space medicine, the Earth viewed from space, physiological training and space art.

The teachers commented that the hands-on activity sessions were always fun. During the

rocketry session, teachers built water rockets from 2-liter soda bottles and launched them at Rocket Park. The rockets looked good, flew well and the water at launch provided a small relief to sweltering sun. Understanding the concept of microgravity was stressed during one of the sessions and teachers participated in several hands-on activities to demonstrate the concept. Astronauts previously demonstrated the physics of microgravity with toys in space and so, using the Liftoff to Learning video series, the teachers took the same toys and were asked to give some predictions. One of the hands-on sessions was the Lunar and Meteorite Curriculum which was conducted by Jaclyn Allen and Cecilia Satterwhite of the Earth Science and Solar System Exploration Division. Food was used in the predictions and discoveries and following the specific concept or lesson, there were afternoon snacks. Concluding the workshop was a demonstration on NASA Spacelink and how educators can obtain vital educational resources and navigate the Internet. Special educator accounts were given out to those who are able to access Spacelink via modem.

"You get a feel for how many talented

people need to come together in order to make space flight possible" said Michele Galvan, a first grade teacher in Santa Fe and wife of Ruben Galvan a Grumman employee in the Management Services Office.

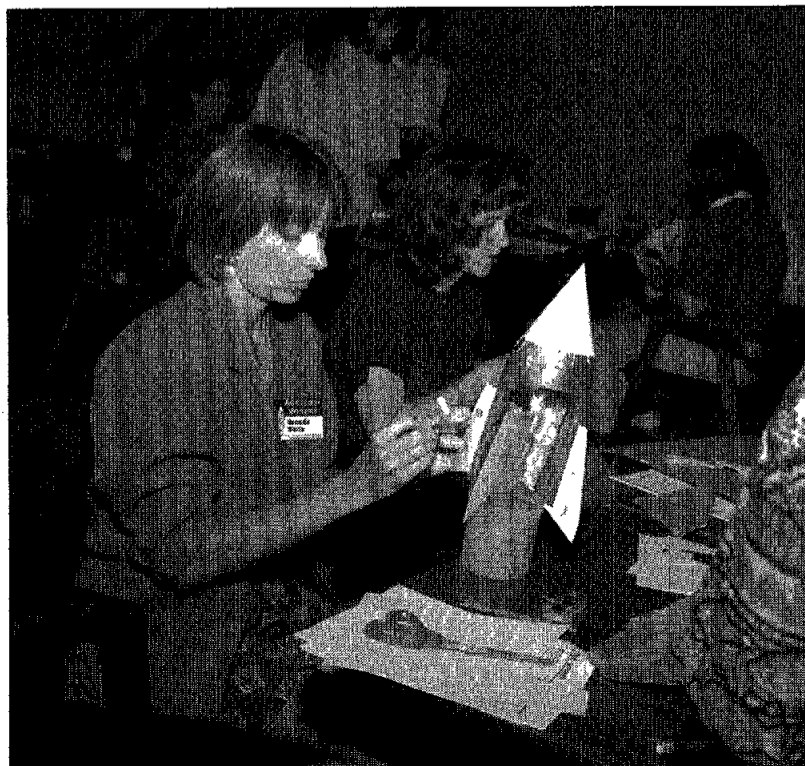
Activity books, lithographs, posters, videos, educational briefs, brochures and books on specific topics were part of the multitude of material the participants received. A Clear Creek ISD teacher mentioned their text books (curriculum) do not give enough background information and the NASA publications really helped her. Using the pictures and posters JSC provided excite the students and she wants to use her new gained knowledge to encourage children to be pro space.

"I can't wait to start implementing this into my curriculum. I hope to start day one of school," said Janet Blott, a teacher in Tomball and a relative of Gwenn Sandoz a Krug employee in the Space Biomedical Research Institute. Specifically, Janet plans to implement her experience in the science and language arts curriculum.

When asked what benefits she foresees as an educator returning to her classroom, Sue Ellen Seaman a third grade bilingual teacher and wife of Charles Seaman of the Integrated Planning System Office said, "Inner city students seem to need so much more exposure and I walk away from this week of schooling with additional knowledge to help me do a better job."

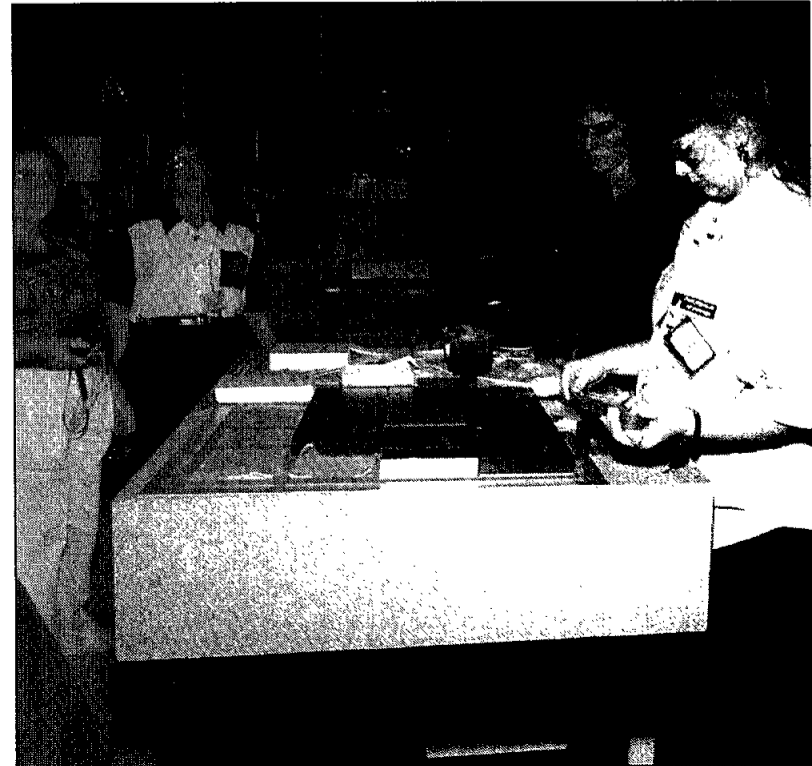
At the beginning, the teachers were told that by the end of the week, they would probably know more overall about JSC than their relatives and that the supper conversations that week truly would be interesting. By the end of the week some JSC employees were mentioning to the Education and Information Services Branch staff that their relatives had been talking about places the employees themselves had never seen. □

(The quality educator workshops that JSC produces would not be possible without the enthusiastic support of the many offices throughout the site. The Education and Information Services Branch thanks all those who support endeavors to bring space into the classroom.)



The workshop is designed to "give back" to those in the community who help with center educational efforts. By helping teachers to integrate space and technology into their curricula, more students benefit with the knowledge they gain about space exploration endeavors, the results of that exploration, and the benefits. Top, Sandra Ciaccio, wife of Michael Ciaccio of Unisys, makes a water rocket during a Principles of Rocketry hands on session. Middle, Connie Watkins, wife of Vincent Watkins of the Operations and Quality Assurance Division examines shuttle tile material in the shuttle tile lab in Bldg. 13. Bottom left, Brenda White, sister-in-law of Jane Shipley of Futron, puts the finishing touches on her water rocket. Bottom right, several educators check out how shuttle tiles are made.

JSC Photos by Benny Benevides



NASA creates minority university information network

NASA has selected seven minority universities to receive cooperative agreement awards for developing Network Resources and Training Sites to stimulate the use of the Internet via computer networks.

The awards will provide the universities with approximately \$400,000 a year of research and development funding for up to five years and enable them to develop information infrastructure and advances that may later be applied in research and education activities.

The NRTS will be responsible for building

and maintaining Internet connectivity to minority institutions and predominantly minority-attended elementary and secondary schools. The sites also will provide training in network implementation, operation and usage to faculty and students at those institutions.

The universities selected to receive awards include Elizabeth City State University, Elizabeth City, N.C.; Morgan State University, Baltimore, Md.; Prairie View A&M University, Prairie View, Texas; South Carolina State University, Orangeburg, S.C.; Tennessee State University, Nashville, Tenn.; The City

College of New York and the University of Texas at El Paso.

These awards are the result of a competitive selection process under the NASA Institutional Research Award program. The objectives of the IRA program are to strengthen the capacity of minority institutions to provide a quality learning and research environment for minorities and to increase their opportunity to participate in and benefit from NASA and other federal programs.

The IRA Program was established in 1994. Six institutions received awards in discipline

areas that support NASA's mission and NASA's Strategic Enterprises. The institutions selected in 1994 include California State University, Los Angeles; the University of Texas at San Antonio; New Mexico Highlands University; Florida International University; the City College of New York and the University of Puerto Rico at Rio Piedras.

The IRA Program is sponsored by the Office of Equal Opportunity Programs, Office of Mission to Planet Earth, Office of Space Science and the NASA Minority University - Space Interdisciplinary Network Program.

NASA selects STTR phase one contracts

NASA has selected 30 research proposals for immediate negotiation of Phase One contracts as part of the 1995 Small Business Technology Transfer Pilot Program.

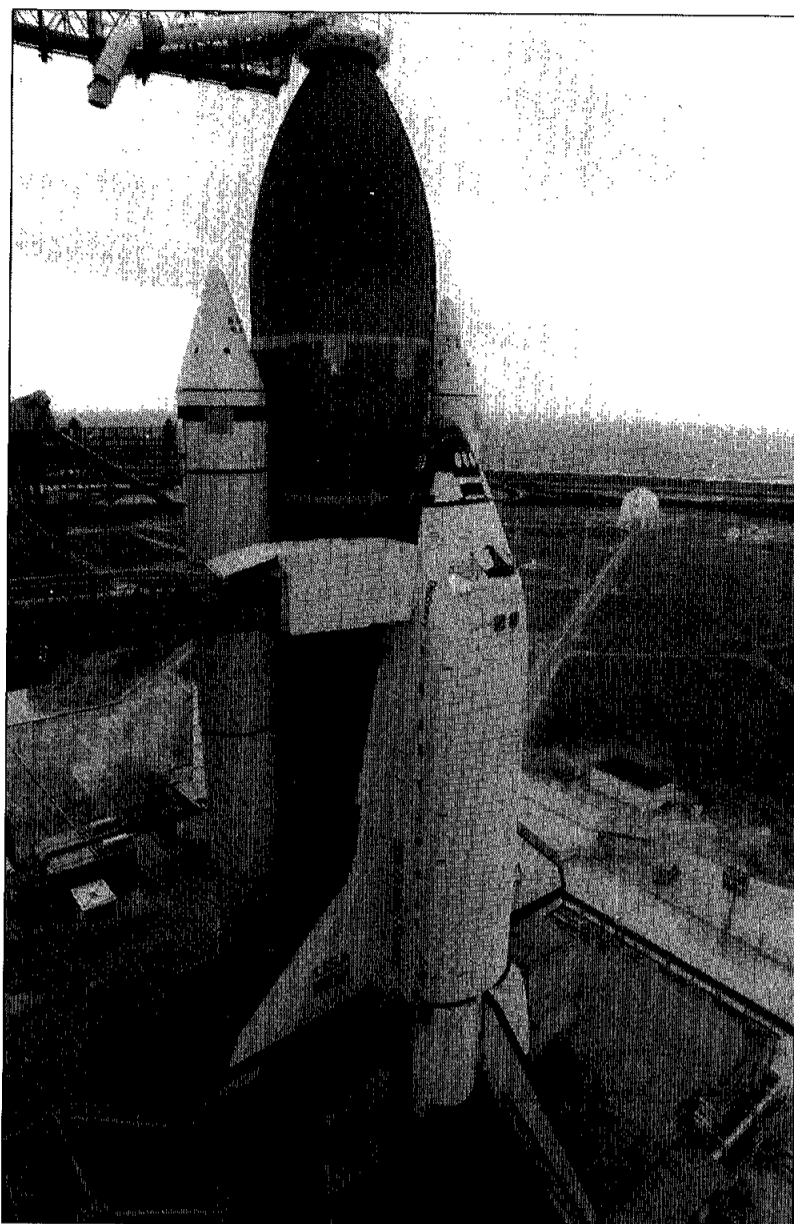
"This program is one of the ways that NASA takes the knowledge gained in air and space exploration and transfers it to the public," said Jack Mansfield, associate administrator of the Office of Space Access & Technology, which is sponsoring the program.

The 1995 Phase I solicitation closed in March. Seventy-nine separate proposals were submitted by 67 small, high technology businesses from all sections of the U.S. Research topics included general aviation, advanced materials and structures for aerospace systems, energy conversion technology, access to space, and Mission to Planet Earth enhancements.

All proposals were reviewed for technical merit and commercial potential. Four NASA field centers participated in these evaluations. The selected proposals will be awarded a contract up to \$100,000.

The STTR program requires small business concerns to conduct cooperative research and development by partnering with a research institution. At least 40 percent of the work must be performed by the small business concern, and at least 30 percent must be performed by the research institute.

Companies that successfully complete Phase I activities are eligible to compete for Phase II awards the following year.



Discovery sits on Launch Pad 39B awaiting the STS-70 crew. A hood called a beanie cap on the external tank vent arm covers the tip of the external tank. The white room on the end of the orbiter access arm mates with the crew hatch.

NASA Photo

New Mission Control assist flight controllers in monitoring health of shuttle

(Continued from page 1)

but far more advanced, computers and network technology. It is a wonder in the way we are applying those technologies to a difficult and complex job. It is the best of its kind."

The new Mission Control Center developed at a cost of about \$250 million, offers an unprecedented flexibility in flight control operations, allowing the facility to be changed from controlling a space shuttle to controlling any other spacecraft with almost the speed of simply choosing a different function from a computer menu. The commercially available equipment and up-to-date technology used in the new MCC will greatly reduce maintenance costs for the facility as well.

Unseen by most who are familiar with television views of the current Mission Control is the supporting equipment for the control room, a first floor completely filled with, by today's standards, obsolescent mainframe computer equipment. A

staff of some 80 is required around the clock during shuttle missions to operate the equipment, and maintenance on the current Mission Control must be done on a circuit board by circuit board basis. For that maintenance, NASA must keep specialists always on hand who know the old equipment in such circuit by circuit detail because similar equipment was long ago purged from the commercial world.

The new MCC uses workstations interconnected via a local area network, doing away with the older mainframe approach and bringing it in line with the systems most commonly in use today. Manufacturers can maintain the equipment on a modular basis, pulling out and replacing entire workstations rather than intricate parts, a change that will reduce the maintenance personnel required for Mission Control by about 180 positions as the current control center is phased out.

In part, the greater capability and

lower costs of the new MCC are benefits gained by NASA from an industry the space program helped create. "In the 1960s, as late as 1963, 90 percent of all of the electronic chips, computer chips, in the U.S. were bought by NASA and the Air Force," Muratore explained. "The industries supporting NASA at that time went on to use that technology to revolutionize consumer electronic products. By using the more easily maintained and more capable commercially available equipment in the new MCC, we are reaping a harvest from seeds planted by NASA in the Apollo era."

In the new MCC, a total of 197 workstations can be used to control both the shuttle in flight and the International Space Station to be launched in 1997. Currently, 204 workstations are required for shuttle flight operations alone. The number of equipment racks needed in the new MCC is half the amount in the current Mission Control. The net-

works in the new MCC are linked by 125,000 feet of fiber optic cable, making it the world's largest fiber data distributed interface network.

The majority of software packages used in the new MCC are standard, commercially available products as well. Only a "thin layer" of software that is inherently required to accomplish tasks unique to shuttle flight control has been developed by NASA. The software also makes use of intelligent systems to assist flight controllers in monitoring the health of the shuttle, although the flight controllers themselves are, as always, the primary mechanism for detection of malfunctions and attempts to resolve them. Although the setting and tools are changing, the philosophy, discipline and the flight control positions themselves remain the same.

"With all of the technology now at our disposal, it still comes down to a human evaluating the information and making all of the critical deci-

sions," Muratore said. "The basic discipline, esprit de corps and dedication that have always made Mission Control work will not change. We are combining the best of the new and the best of the old."

The White Flight Control Room is located in a new wing of the MCC, down the hall from the current Mission Control. The Multi-Purpose Support Rooms, back rooms that support the various flight control positions in the current Mission Control, also will move to a room adjacent to the White Room.

Although STS-70 is the first flight from the New Mission Control, simulations, computer-generated practice flights, began in December and flight controllers also have used the room for "flight-following," monitoring and providing some support for activities in the current MCC. The control center also has been used for other projects, including the control of a prototype Russian planetary rover in testing.

Crew briefing set for Wednesday

(Continued from page 1)

the team that trained him on the docking mechanism.

"It performed absolutely flawlessly. We were prepared for anything that could have gone wrong. It was really a superb effort on their part," Harbaugh said.

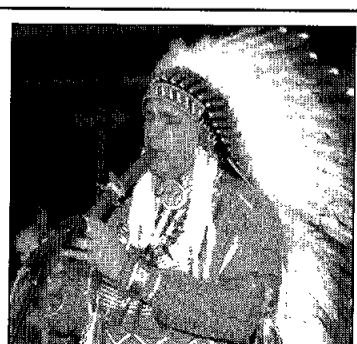
Mission Specialist Bonnie Dunbar said the excellent workmanship of the European Space Agency in building of the Spacelab was one of her most memorable moments.

"It is an absolutely incredible working machine. It just hums along, it

supports the experiments, its wonderful," Dunbar said.

The crew of STS-71 will share flight memories with employees at 2 p.m. Wednesday in Teague Auditorium.

Gibson, Precourt, Baker, Harbaugh and Dunbar will be joined by Mir 18 cosmonauts Commander Vladimir Dezhurov, Flight Engineer Gennady Strekalov and Astronaut Norm Thagard to discuss the shuttle/Mir docking. The crew will brief the public at noon Wednesday at Space Center Houston.



Jerry Elliott opens the American Heritage Day festivities with flute music in complete Osage/Cherokee dress.

Spaceweek lectures focus on cooperation

The Institute of Electric and Electronics Engineers will host a week of space lectures at noon all next week in the Teague Auditorium.

The lectures will focus on "Space: Bringing the World Together," and features several space experts on various topics.

On Monday, Walter Kiefer of the Lunar and Planetary Institute will discuss "Magellan Looks at Venus." Tuesday's participants will get an overview of the International Space

Station. Wednesday will feature a discussion on "Russian Cooperation in the International Space Station," with James Nise of the Russian Program Office.

Rounding out the week is Paul Spudis of the Lunar and Planetary Institute discussing "New Results from Clementine," and STS-71 Flight Director Bob Castle on Friday discussing the "Shuttle/Mir Docking."

For more information call Cliff Mason at 335-6897.

New MCC open for viewing

The new Mission Control Center viewing room will be open to JSC and contractor badge employees and their families during the STS-70 mission.

Employees will be allowed to visit the MCC from 11:30 a.m.-2:30 p.m. Wednesday.

Employees must wear their badges and escort family members to the lobby located at the south or southeast entrance of Bldg. 30

South and take the elevator or stairs to 2M.

Children under 5 will not be permitted. No flash photography or loud talking will be permitted at any time.

Because of the dynamic nature of shuttle missions, viewing hours may be changed or canceled without notice.

For the latest information on the schedule, call the Employee Information Services at x36765.

Lunar run will close streets

The Loral Lunar Rendezvous Run will be held beginning at 8 a.m. Saturday at the Gilruth Center and will close access to some streets on site.

The run, held in conjunction with the annual Lunar Rendezvous celebrations, will consist of a 5K race and a 2-mile walk. Entry fee is \$17 and includes a t-shirt, refreshments and eligibility for door prizes.

Members of the Houston Area Road Runners Association receive \$1 off their entry fee. Several streets will be closed for the event. Second street from the Gilruth Center to Ave. B and portions of Ave. B and fifth street will be closed from about 7:15-9 a.m. Parking lots along the run route may be restricted during the event. For information call Dennis Halpin at x36093.

JSC software available commercially

(Continued from page 1)

be used in any software improvement effort, from simple rehosting to complete restructuring of the code using the object-oriented paradigm," Hoffman said. The SRT currently runs on Sun SparcStations using the Solaris 2.3 operating system.

ReSoft was formed in 1995, as a spin-off of Barrios Technology, Inc., to provide commercial products and services for the reengineering and improvement of existing software. The company is currently a client of the Johnson Technology Com-

mmercialization Center in Houston, a NASA-funded center operated by the Institute of the University of Texas at Austin. The JTCC assists entrepreneurs to build businesses that are based on NASA technology by furnishing shared-cost office space and special executive services for high technology businesses as well as helping to assess and obtain licenses to NASA technology. The agreement between JSC and ReSoft, Inc., was coordinated by the Office of Technology Transfer and Commercialization.