

Space News Roundup

Vol. 29

May 25, 1990

No. 21

JSC works to improve organizational culture Survey identifies four areas of concern

By Kelly Humphries

JSC Director Aaron Cohen has approved a set of strategies to improve four specific areas of employee concern identified in the 1989 JSC Culture Survey.

The four areas were selected because they cut across organizational lines or had center-wide impact.

Although JSC's culture or "how we do things around here" compares favorably with industry, the survey showed there still is room for improvement in decision-making, career development, workload, and cooperation and teamwork, said Human Resources' Chris Parker, who

coordinated the JSC portion of the NASA Culture Survey.

The shortcomings were identified after analysis of the 2,100 survey responses (60 percent of all civil servants) collected in March and April 1989 and in-depth discussions with 411 employees in focus groups during the fall of 1989, Parker explained.

While organizations were given feedback specific to their operation, a senior staff working group interpreted the survey and focus group results, then presented recommendations to Cohen. The working group was comprised

Please see **SURVEY**, Page 4

Cohen establishes Director's Forum

By Kelly Humphries

JSC Director Aaron Cohen, responding to employees' hunger for more time to discuss issues with senior managers informally, will begin a monthly Center Director's Forum in June.

The forum is an immediate result of an employee suggestion and ties into the recently completed 1989 JSC Culture Survey, which identified a need for improved management-employee communication. The first meeting is targeted for June 20.

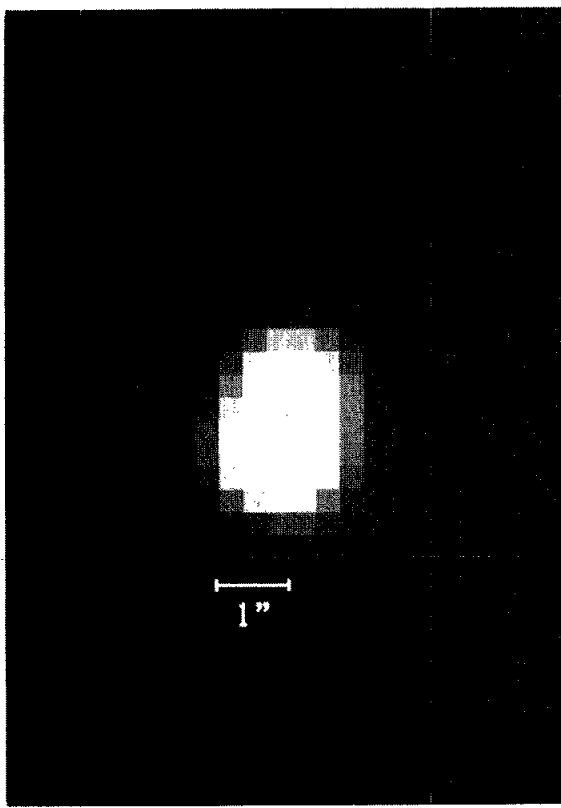
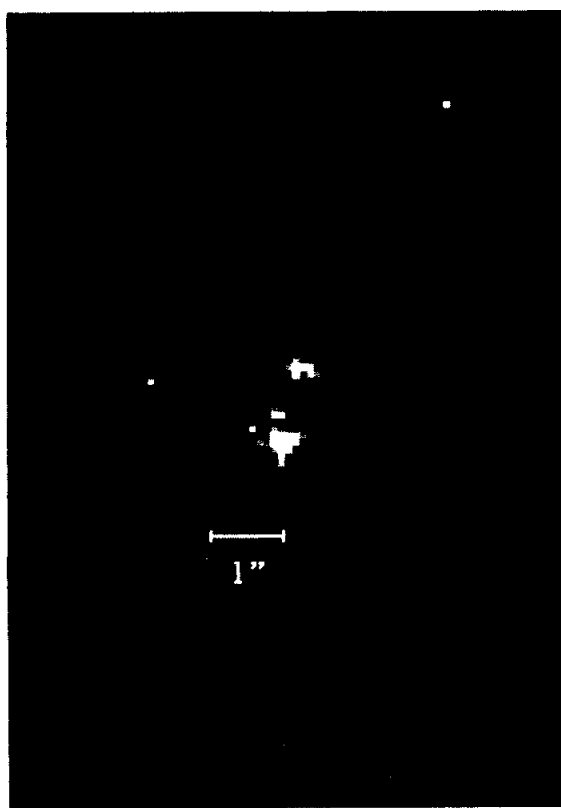
Cohen intends to meet in his office with six or seven "top performers" from across the

center to openly discuss issues of mutual concern involving the center and the agency.

In establishing the forum, Cohen said he is making an effort to increase his accessibility, encourage two-way communication, recognize exceptional performance and enhance employee visibility.

"I feel we have good management-employee communication here, but there's always room for improvement," Cohen said. "That's why I'm opening this forum. We have some of the most talented people in the world at this center, and I want to have a chance

Please see **COHEN**, Page 4



NASA Photo

The image at right is a portion of the first test photo from the Hubble Space Telescope's Wide Field/Planetary Camera. The ground-based image at left was taken from the Las Campanas Observatory in Chile.

Hubble confirms double star

By Kari Fluegel

The Hubble Space Telescope began a life of discovery Sunday as its Wide Field/Planetary Camera opened its shutter for the first time and confirmed the existence of a double star in the southern constellation Carina.

The preliminary sample of the telescope's capability already has scientists pleased.

"All of the large scientific space instruments go through a several month adjustment period," said Dr. Karl Henize, former astronaut and senior scientist in the Space Science Branch of the Solar Sys-

tem Exploration Division at JSC.

"As an astronomer I'm impressed with the first images. It probably doesn't look like much to the general public—just a couple more fuzzy dots—but the images already are equivalent to the best data from ground based telescopes and they are expected to get at least five times better image quality. That's when the scientific data will get exciting."

The "first light" photograph was downlinked from HST Sunday and was met with enthusiasm from controllers and scientists. The photograph confirmed a theory that

what is seen from Earth-based telescopes as an elongated light in the open star cluster NGC 3532 is actually two stars.

The telescope achieved a resolution of 0.7 arc seconds, significantly better than the anticipated 1.5 arc second resolution. When HST enters its operational life, the camera's resolution will improve to 0.1 arc seconds, said James A. Westphal, principal investigator of the Wide Field/Planetary Camera. An arc second is 0.36 of a degree.

Earth-based telescopes rarely exceed the resolution of Hubble's first light photograph, he said.

Managers eye launch target for next week

By Kyle Herring

With repairs completed on *Columbia's* Freon coolant loop, shuttle managers met Thursday to evaluate the readiness of the vehicle to support launch of the STS-35 mission next week.

Work to replace a faulty flow proportional valve went smoothly, allowing an internal target date of May 30 to be set pending outcome of the managers' "delta" flight readiness review at the Kennedy Space Center.

If the night launch remains scheduled for May 30, it should occur at 12:38 a.m. EDT, which equates to an 11:38 p.m. CDT May 29 liftoff.

The valve was replaced at the launch pad when it was determined that the flow was restricted and not at an acceptable level for launch.

At launch pad 39A, workers continued close outs of the aft compartment and prepared to clear the pad of non-essential workers for installation of ordnance devices on the solid rocket boosters.

The seven-member crew for the 36th shuttle mission is continuing simulator training and now plans to leave Ellington Field for Kennedy on Sunday.

Vance Brand is commander of the flight with Guy Gardner as pilot. Mission specialists are Mike Lounge, Jeff Hoffman and Robert Parker. Ron Parise and Sam Durrance will be

payload specialists.

Brand has flown in space three other times. His first flight was aboard an Apollo spacecraft which joined with a Soviet crew in space. He also commanded shuttle missions STS-5 and STS-41B. Gardner flew as pilot on STS-27.

Lounge is making his third shuttle flight, having served as a mission

specialist on STS-51L and STS-26. This will be Hoffman's second space flight. He was a mission specialist on STS-51D.

Parker was a mission specialist on STS-9, the first Spacelab mission.

Parise and Durrance are making their first space flights.

After launch, the crew will activate the ultraviolet astronomy telescope package (Astro-1) along with the Broad Band X-Ray Telescope (BBXRT). The four telescopes that make up the payload package often will make observations of the same objects concurrently. The BBXRT will be serviced with argon for cooling once more before launch.

If launched on May 30, landing would be on June 7 or 8 depending on whether the mission is extended a day for additional observations. That decision will be made real-time based on the amount of fuel and crew provisions available.

STS-35 is the first flight of seven crew members and payload specialists since the return-to-flight.



STS-35
Astro-1

Bringing space into living rooms

Amateur radio experiment lets public get involved

By Kari Fluegel

Amateur radio operators around the world will have a rare opportunity to communicate with the orbiting *Columbia* when Payload Specialist Ron Parise fires up his ham radio equipment during STS-35.

Parise, a licensed amateur operator with the call sign WA4SIR, will conduct radio transmissions between ground-based amateur radio operators and the orbiter as part of the Shuttle Amateur Radio Experiment (SAREX).

"The public needs to feel they are a part of the space effort," said Lou McFadin, principal investigator. "This brings the space effort into their living

room. They can be a part of it."

The experiment is sponsored by the American Radio Relay League and the Amateur Radio Satellite Corp.

Parise's communications for SAREX will occur during part of his pre- and post-sleep periods each day. Communications will be primarily limited to operators in Australia, Japan, South America and South Africa since connections are limited to operators in the immediate area over which the orbiter is passing.

The continental United States has little or no coverage during voice transmission times except through a network of ground station relay links

from other parts of the world.

These dedicated telephone line bridges will be used to link operators in a fashion similar to a conference call. Several of these links will allow school children to talk with Parise during the Astro mission.

Parise and the other astronauts on board *Columbia* also will attempt to contact the orbiting Soviet space station Mir and cosmonauts Anatoly Soloviev and Alexander Balandin.

"We're real excited," said John Nickel, treasurer of the JSC Amateur Radio Club and the technical representative of ARRL.

Please see **RADIO**, Page 4



JSC Photo

SAREX Principal Investigator Lou McFadin, left, and STS-35 Payload Specialist Ron Parise show the packet module that provides power and data connections to the shuttle and the outside world.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.

General Cinema (valid for one year): \$3.75 each.
 AMC Theater (valid until May 1991): \$3.50 each.
 Sea World (San Antonio, year long): adults, \$17.25, (2-day, \$21.95); children (3-11) \$14.75, (2-day, \$18.95).
 Astroworld (valid 1990 season): season, \$39.95; regular, \$15.97; children, \$9.21; Waterworld, \$8.15; 2-day—AW/WW, \$18.47.
 Astros vs. Cincinnati (June 8—last day to purchase tickets is May 29): \$6 each.
 "Flashback to the Fifties" (Variety dance, June 15): \$15 each.

JSC

Gilruth Center News

Sign up policy—All classes and athletic activities are first come, first served. To enroll, you must sign up in person at the Gilruth Recreation Center and show a badge or EAA membership card. Payment must be made in full at the time of registration. Classes tend to fill up four weeks in advance. For more information, call x35789 or x30304.

EAA badges—Dependents and spouses may apply for a photo I.D. 6:30 p.m.-9:30 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m. July 21 and Aug. 18; cost is \$15.

Weight safety—Required course for those wishing to use the Rec Center weight room. The next classes will be from 8-9:30 p.m. June 6 and June 21; cost is \$4.

Aerobics and exercise—Both classes are on-going. Sign up in the Rec Center.

Country and Western dance—Lessons begin June 4. This course will be held every Monday for 6 weeks, cost is \$20 per couple.

Summer softball sign-ups—Sign-ups will be the week of June 19 at the Rec Center.

New way to start your day!

The JSC Employee Information Service now is updating its reports at 8:30 every morning.

For the latest information on what's happening at JSC, from seminars to crew return ceremonies, the Employee Information Service has what you're looking for.

The recorded announcement can be reached by calling:

483-6765

JSC

Dates & Data

Today

Cafeteria menu—Special: tuna and noodle casserole. Entrees: broiled codfish, fried shrimp, baked ham. Soup: seafood gumbo. Vegetables: corn, turnip greens, stewed tomatoes.

Monday

Cafeteria menu—Special: meatballs and spaghetti. Entrees: wieners and beans, round steak with hash browns. Soup: chicken noodle. Vegetables: okra and tomatoes, carrots, whipped potatoes.

Tuesday

JSC Astronomy Seminar—An open discussion meeting will be held from 12:30-1 p.m. May 29 in Bldg. 31, Rm. 129. For more information call Al Jackson, x33709.

Cafeteria menu—Special: fried chicken. Entrees: beef stew, shrimp creole, sweet and sour pork chop with fried rice. Soup: beef and barley. Vegetables: stewed tomatoes, mixed vegetables, broccoli.

Wednesday

Cafeteria menu—Special: Swiss steak. Entrees: fried perch, New England dinner. Soup: seafood gumbo. Vegetables: Italian green beans, cabbage, carrots.

Thursday

Cafeteria menu—Special: stuffed bell pepper. Entrees: turkey and dressing, enchiladas with chili, wieners and baked beans. Soup: cream of chicken. Vegetables: zucchini squash, English peas, rice.

June 1

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

June 3

International Conference—The Space Summit will hold an International Conference on Manned Space Exploration June 3-6. For more information call 1-800-448-4053.

June 4

MPAD wake and reunion—The Mission Planning and Analysis Division (MPAD) plans a wake and reunion (W&R) for the now-defunct branch. All former civil service MPAD'ers are invited to the 4-8 p.m. June 15 event at the Gilruth Recreation Center Pavilion. Deadline for reservations is June 4. For more information, call Gloria Martinez at x38091.

June 7

Technical society banquet—The Clear Lake Council of Technical Societies will hold an awards banquet at 6:30 p.m. June 8 at the Rec Center. For more information, call Andy Lindberg, x31474. For reservations call Marcia, x30195.

June 8

JSC Astronomical Society—The JSC Astronomical Society will receive "Reports from the Texas Star Party" at 7:30 p.m. June 8 at the Lunar and Planetary Institute. For more information, call Bill Williams at 339-1367.

June 20

ISMCR symposium—JSC's Automation and Robotics Division will host the first International Symposium on Measurement and Control in Robotics (ISMCR) June 20-22 at the Rec Center. The symposium is sponsored by the international organization, Imeko, and is expected to include representatives from 31 countries. Astronaut Story Musgrave will be keynote speaker. Sessions will run from 8 a. m.-5 p.m. daily, with the conference ending at

noon June 22. For more information call Mary Stewart at x31724 or Dr. Zafar Taqvi at 333-6544.

June 26

BAPCO meeting—The Bay Area PC Organization will meet at 7:30 p.m. June 26 at the League City Bank & Trust. For more information call Earl Rubenstein, x34807, or Tom Kelly, 996-5019.

July 16

Spaceweek Banquet—Spaceweek will hold a national banquet at 6:30 p.m. July 16 at the South Shore Harbour Resort & Conference Center, Crystal Ballroom. Dr. Harrison Schmitt will serve as keynote speaker with an introduction by JSC Director Aaron Cohen. Contact Tanya Lytle, 333-3627, for more information.

Oct. 30

Space conference—The fourth annual Space: Technology, Commerce and Communications Southwest conference will be held October 30-November 1 at the Nassau Bay Hilton. Rockwell Chairman Donald Beal and NASA Deputy Administrator J.R. Thompson will serve as guest speakers. For more information, call John McLeish, 480-7445.

Space Exploration '90—A major conference and aerospace industry exposition, sponsored by the NASA Alumni League, will be held Oct. 30-Nov. 1 at the South Shore Harbour Resort and Conference Center. Contact Carol Ramey, exposition manager, 800-765-7615, for information.

Nov. 27

National Technology Conference—Technology 2000 will have a meeting on Nov. 27-28 at the Washington Hilton Hotel. For more information call 212-490-3999.

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. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2.

Property

Lampasas Cty., 1,011 acres, \$425/acre, all amenities. 946-7587.

Sale: Duplex rent prop., Galv., currently leased for \$700/mo., \$52,900. Ken, x36869 or 534-3554.

Sale: Friendswood 3-2-2, Gunite pool, new paint/carpet, fans throughout, \$88,500. x34902 or 996-9128.

Rent: Lake Travis cabin, priv. dock, CA/H, fully equipped, accomm. 8, wkly./dly., \$425/\$85. 326-5652.

Rent: 2 rooms in LC, \$250/mo. furn., \$225/mo. unfurn., split bills, non-smokers, pets tolerated. Russ, 332-4336.

Sale: Big Bend area, hunting, 160 acres, \$120/acre, CFD 15% down, 9% for 8 yrs. 337-4051.

Sale: Bay house on Caranchua Bay near Palacios, furn., access to ramp/pier, \$40K. (409) 543-2052.

Sale: 2 lots in LaPorte, total sz., 75x220, \$5K/ea. 944-5624.

Sale: 2 lake lots on Toledo Bend Lake, wtr., elec., septic tank, \$10K. 944-5624.

Lease: Friendswood/Forest Bend, 3-2-2, fan, patio, new carpet/AC, no pets, \$595/mo. 482-6609.

Lease: Bay Area Blvd. condo, 2-2, new carpet/paint, W/D conn., refrig., no pets, non-smoker, avail. now, \$460/mo. Rodney, x38889 or 480-1340.

Sale: 2-1, carpet, fans, gar., wkshp. on 7 lots, 17 mi. so. of Livingston. Pat McCulley, (409) 327-2500 or (409) 365-2848.

Lease: 1 BR Nassau Bay apt., avail. until June 30 w/possible ext., rent nego., bills pd. Susan, x32444 or 484-3570.

Lease: 1 BR condo, CLC, FPL, W/D conn., appli., micro., fans, avail. June 1. Jim Briley, 488-7901.

Sale: 60 acres, 3 mi. from Karnes City, TX, 50 mi. from San Antonio; 2-story house on 1.5 lots w/many fruit trees in El Campo. 783-9164.

Rent: Galv. condo, furn., sleeps 6, Seawall and 61st, dly./wkly. rates. x33479 or 486-0788.

Sale: Camino So., 3-2-2, hdwd. floors, new carpet, near RSOC, 9.5% FHA assum., \$79,900. Brian, x37070 or 280-8500.

Trade: Westwood Shores lot, val. \$9,500 for PU, van or Suburban of equal value or

\$7,500 cash. 554-6841.
 Trade: 4-3 off 360 W. of Austin, prefer 5 yr. old, open plan w/in 20 min. of JSC. 471-8795 or 333-6083.

Sale: 2 lots, 1/3 acre/ea., \$80's-\$90's, owner fin. w/10% down. 482-5226.
 Sale: Dickinson 3-2-2, lg. LR, kitch., MB. x38078 or 534-2761.

Sale: Waterview lots near NASA, mid \$30's. Don, x38039 or 333-3313.
 Rent: Pasadena 3-1-2 furn., AC/heat, carpet, stor., trees, priv. fence, avail. immed. 472-6980.

Cars & Trucks

'88 Volvo 740 turbo, warr., curr. NADA value. Phil, 282-3600.

'81 Olds Toronado, V8, loaded, ex. cond., new paint, \$2,750, OBO. Ron, x36158 or (409) 945-8787.

'84 Pontiac Sunbird, 5-spd., AM/FM, tilt, \$1,000, OBO. Joeva Ross, x36147.

'82 Olds Cutlass, 2-dr., V6 auto., cass., 74K mi., \$2,100, OBO. x36149 or 280-9506.

'82 Porsche 924, ex. cond., 62K mi., 5-spd., well maint., \$7,250. 280-8796.

'65 Olds Starfire sport coupe, good cond., \$2,500, OBO. Tom, x38298 or 488-4089.

'76 Camaro, equalizer, stereo, reb. eng., needs body wk., \$850. 280-2289 or 338-1469.

'80 elec. comuta-car, 40 mi. range, 38mph, \$1,800. 532-4784.

'85 Corvette, low mi., all pwr., handling pkg., ex. cond., \$14K. 488-8493 or 480-4982.

'35' Mallard motor home, loaded, low mi., \$36K. 337-4051.

GMC van., rally STX, 8 passenger, loaded. x33656 or 486-8276.

'85 T-bird Elan, ex. cond., PW, PS, cruise, tilt. 538-1854.

'88 Hyundai GL, 4-dr. sedan, 5-spd., immac. cond., warr., BO. Becky, x31420 or 488-0556.

'86 Cadillac Sedan DeVille, ex. cond., loaded, \$10K, OBO. x39261 or 641-4894.

'87 Pontiac Bonneville, 4-dr. sedan, 3.8L V6, ex. cond., 57K mi., \$7,200. Sy, x30504 or 776-9754.

'83 Parting Out Honda Accord, 4-dr., 1750cc eng., 5-spd. 554-3622.

'87 Chev. Cavalier, 4-dr., loaded, 48K mi., ex. cond., \$4,600. x39579 or 482-6187.

'85 Buick Electra Park Ave., 4-dr., 66K mi., new tires, ex. cond., \$6,900. 482-1535.

'86 Chev. Monte Carlo L.S., AM/FM/cass., clean, 70K, \$4,500. Dave, 482-1056.

'84 Honda Civic, DX 3-dr. hchbk., ex. cond., \$3,500. x31894.

GT trick scooter, front/back pegs, ex. cond., \$75. 280-9822.

25" World Sport Schwinn, alum. wheels, good cond., \$150. 486-7623.

'81 Suzuki 850cc motorcycle, low mi., ex. cond., snow suit, helmets, \$1,400. Patrick, x32635 or 488-1079.

Boats & Planes
 14' Hobiecat w/trlr., no leaks, \$700. Elizabeth, 280-1814 or 333-3106.

1/3 interest in P35 Bonanza, digital IFR avionics, HSI, RMI, flight dir., autopilot, hangared at Houston Gulf, \$9,000. x35298 or 487-3857.

Aircraft propeller, Sensenich 74DM6-0-58, fits some Beech, Piper PA-18, PA-22, PA-28 series aircraft, \$900. 538-2299.

2 sailboats, 26' Yamaha, ex. cond., \$19K or 16' G-Cat, good cond., w/trlr., \$1,000. Bryan, x30385 or 335-1559.

14' alum. Jon boat, baitwell, galv. trlr., 15hp Evin., \$795. Boyd, x38623 or 479-7171.

Audiovisual & Computers
 Accelerator card for Amiga 2000, 68020/6881/68851, 2 Meg, 14.3 MHz, \$700, OBO. Boykin, x37341 or 326-1267.

Commodore 64, Mannesmann printer, 1541 disk drive, Paperclip, Print Shop SW, \$250. Mike Mullane, x32798 or 486-8862.

AT&T 6300, 32 Meg HD, 1200 baud modem, 2 floppy drives, \$900. Mary Lou, x34306 or 480-2206.

Z-80 computer, S-100 bus, dual 8" floppy disk drives, 64K RAM, CP/M/Wordstar SW, \$175; Teletideo 920 terminal, \$125, both ex. cond. George S., x37533.

Apple IIe, 64K mem., 2 5.25" disk drives, monitor, joy stick, misc. prog., \$400. 486-5137.

Compaq Desk Pro, color, 640K, 2 FDD, 20 MHD, modem, \$850. 486-8659.

Household
 Dresser and chest of drwr., \$200. Phil, 282-3600.

Sofa/loveseat, beige, contemp., good cond., \$350. Bonnie, x35829 or 486-4572.

3 matching shelf/cab. modules, backlit shelves, lt. walnut w/rattan trim, was \$1,500, now \$600. Bob, 484-0898.

Hard rock maple DR table, 2 ex. leaves, \$75; brass oriental noodle server, \$125; 2 Spanish dec. chairs, velvet, \$25/pr. 488-5564.

Couch/loveseat, blk., used 3 mos., ex. cond., \$500. x38504 or 486-1729.

Bench Craft rocker rec., ex. cond., contemp., cream white, \$200. Phil, x32129 or 480-4148.

Kenmore washer, Whirlpool dryer, good cond., \$80/ea. Mike, 335-1793.

Full bkcs. hdbd., dresser w/mirror, chest, nightstand, \$300. Victor, x35983 or 538-1658.

2wndw. AC units, 12K BTU/ea., ex. cond., \$350/ea. or \$650/both, OBO. x37246 or 538-3055.

Musical Instruments
 Stratocaster w/hd. case, 1 yr. old, \$250; Marshall amp., 12 watt, \$200. Chuck Bailey, x32340.

Lost & Found
 Lost red tabby Persian, neutered, lop-sided tail, CL area, x36689 or 480-1045.

Found book "Buoc Chan Non" by Diep My Linh. Steve, x31118.

Pets & Livestock
 AKC reg. Cocker Spaniel pups, 8 wks. old, first shots, 2 M, 2 F, buff color, \$200/ea. Leti, x36502 or 481-8858.

Cockapoo pups, solid blk., F, \$75, M, \$50. 996-0981.

English bulldog, AKC papers, male, 1.5 yrs. old, \$300. Phil, 282-1776.

1 male Cocker Spaniel pup w/papers, blk., shots, 12 wks. old, \$175. Mary, 282-2535 or 943-3726.

Wanted
 Would the man who had the Retina IIIc stolen but still had the case and lens call me, we spoke on the phone sev. yrs. ago. Jack Day, 664-9472.

Want to start John Lennon fan club, and set up 50th yr. festival in CLC for John Lennon. 488-1044.

Want dependable ride from Pasadena/Raspberry, flex. hrs. Pee Wee. x33778 or 946-7587.

Want Volvo 15" turbo wheel (5 spokes) in good cond. Vincent, x30874 or 333-1316.

Want sitter for 1 yr. old, begin Aug., Ellis Landing area, non smoker, slide rule T.V. converter. 332-0365.

Want waitress, part time call in as needed, some exp. needed. Gilruth Center AW, x30326.

Want John Lennon and Rolling Stones paraphernalia. 488-1044.

Want toy trains and Starwars toys. Ron, 482-1385.

Want lt. wgt. video cam., VHS format. 484-0898.

Want 17' or 18' alum. canoe in good cond. 282-3554.

Want used scuba fins, men or women's. Edward, 335-2542 or Karen, 335-2496.

Want to rent 3 BR home near JSC. Kathleen, 480-1024 or 333-7075.

Want Nebulizer machine Pulmo-Aide, Maxi-Mist, etc., no attach. needed. Sandy, x39342 or 538-2169.

Want chrome step bumper for '88-'90 Chevy PU or '88-'90 Ford van, to \$75. Don, x38039 or 333-3313.

Want fem. roommate to share 3 BR duplex w/1 or 2 other fem. Jana, 338-2588 or 283-4262.

Want ATV 4-wheeler, prefer Honda, water pump convert. shallow/deep well or submersible. x30135 or 471-2490.

Miscellaneous
 Std. 3x4 chain link fence gate, \$20, OBO. 554-6629.

Engagement ring, 18 karat yellow gold, round diamond solitaire, .68 carats w/6 round diamonds, 18 carats, \$1,200. x30874 or 333-1316.

VHS movies, \$10/ea.: What's Up Doc?, Change of Habit, Calamity Jane, Hello Dolly. Linda, x34044 or 280-0909.

Misc. NASA memorabilia. Linda, x34044 or 280-0909.

Prom dresses, fushia taffeta, sz. 5, \$75; royal blue, puff sleeves w/lace, sz. 3, \$100; purple v-back w/bow, flap around waist, sz. 3, \$90. Rose, x36811.

Party dresses, turquoise spaghetti straps w/jacket, blk./gathered around waist w/bow on side, sz. 7/8, \$50; pink w/lace sleeves, sz. 3, \$50. Rose, x36811.

Mont Blanc fountain pen, Meisterstuck No. 146, virt. new w/factory recond. nib, fine point, \$125. George S., x37533.

Royal elec. typewriter w/case, \$85; wall barometer/thermometer, \$12.50; AM/FM radio telephone, \$22.50. 488-5564.

Wgt. bench, \$30; exer. bike, \$30. Virginia, 480-1225.

Leer camper for full sz. short bed PU, \$300. Steve, 471-6160.

1 pr. ladies blk. snake shoes, sz. 7AA, 2.5" heel, cut out toe w/bow on toe, never worn, \$25. 996-1954.

Sears drafting table/chair, \$50; Bradford ster. sys., \$20; Wards sewing mach., \$40; Avon bottle assort., \$4/ea.; Bentley 35mm cam.cass., \$10; metal nightstand, \$5; misc. elec. parts/voltmeter, \$10. Steve, x35450 or 480-1658.

Home water filter, warr., new, \$80. 480-1024 or 333-7075.

Sofa bed, 90x36, 2 swivel rockers, bar stool, table lamp, motorized hip/thigh belt exer. 532-1994.

Hibiscus plants. 482-5226.

Port. Sunbeam gas grill, good cond, 3 shelves, self starter, manual, \$40. x31911 or

Technology Transfer

Applying JSC projects to Earth-bound problems contributes to medicine, education, manufacturing

By Karl Fluegel

Space technology continues to spin into the private sector as eight JSC projects follow the pathway once traveled by cordless power tools, a firefighter breathing apparatus and heart pacemakers, according to the recently released 1989 Technology Utilization Office annual report.

Transferring technology to the private sector has been a priority in NASA since the early days of the agency. Now almost everyone comes into contact with space technology at least once every day.

"This technology already exists," said Dean Glenn, JSC's Technology Utilization Officer. "The taxpayers have paid for the development of these technologies. These types of transfers not only help a variety of people, they allow the United States to be competitive in the international market."

The current eight Office of Commercial Programs projects funded at JSC incorporate a variety of technologies developed previously for the space program and will enhance the fields of medicine, education and manufacturing.

- The Locator System for Wandering Individuals incorporates state of the art tracking technology into a system which monitors patients who have the tendency to wander, for example those suffering from Alzheimers Disease.

The system is based on microelectronics and data sequencing technology. From the base station a transmitter emits a radio frequency signal that is received by a transceiver (transmitter/receiver) worn on the person being monitored. The transceiver then transmits a response to the base station where a microcomputer performs the calculations necessary to determine if the individual is beyond the limits set by the base station. The system allows controlled freedom rather than enforced restriction.

The locator project is an interagency effort supported by the Administration on Aging, the Veterans Administration, the National Institute of Aging, the National Institute of Disability and Rehabilitation Research, and NASA. The project is led at JSC by Shayla Davidson of the Tracking and Communications Division Systems Analysis Office.

A prototype is being built and will be available

for testing later this year.

- The Low Vision Aid project is aimed at helping people with maculopathy or blind spots in the field of vision, and retinitis pigmentosa or tunnel vision.

The aid incorporates remapping technology to warp an image so the user receives a more complete picture, using the still functioning areas of the retina to compensate for blind areas, said Richard Juday, the project technical manager. It does not provide the user with perfect vision, but makes better use of what vision remains.

The aid will consist of a portable spectacle-mounted display with a miniaturized camera input and the remapper.

The project is co-funded by the U.S. Army Missile Command and NASA Technology Utilization. Prototype testing with patients will begin later this summer.

- The goal of Advanced Flow Cytometry is to resolve some of the difficulties encountered in cell analysis using multi-channel flow cytometry.

Flow cytometry is the separation and identification of cells using fluorescent dye "tags" and a variety of light sources to sort the cells, said Dr. Gerald Taylor, Biomedical Monitoring and Countermeasures Project manager. The new system incorporates space advancements in fluidics, electronics and optics and was developed for use on Space Station *Freedom*, Taylor said.

The spinoff is a user-friendly system for routine use in clinical and laboratory settings by staff with limited training in optical physics.

- Digital Microscopy is another project that aids in cell research by digitizing images for analysis and transmission.

The system, also being developed for *Freedom*, will have the capability to find, identify and focus on different items in its field of view automatically, as well as maneuver the microscope slide by itself, Taylor said.

For several years JSC has been involved in developing the ability to digitize images from the microscope for the purposes of image enhancement, computer analysis, comparison with training sets, storage, transmission and recall.

The advances in Digital Microscopy will allow the documentation of cell information for research purposes throughout the private sector.

The American Cancer Society has expressed interest in both the Digital Microscopy project and the Advanced Flow Cytometry project, and has actively supported the latter.

- The Computer Automated Manufacturing project incorporates state-of-the-art computer and robotic technology.

In a cooperative effort with Wang Laboratories and the University of Lowell in Massachusetts, researchers hope to develop for demonstration at Wang a fully automated manufacturing system that will enhance component placement on computer circuit boards to the 99.9 percent output quality level.

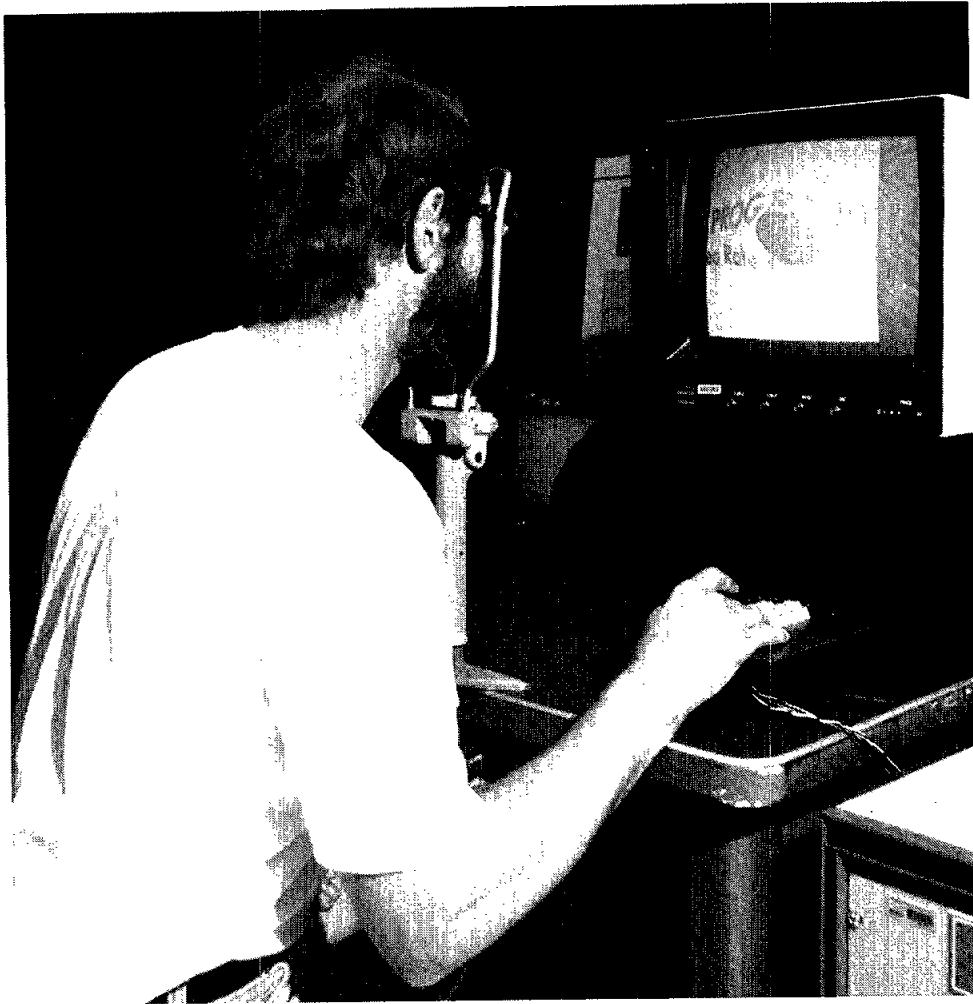
The technology will help Wang compete directly in the international marketplace, said Dr. Tim Cleghorn, the project's technical manager.

The program uses CLIPS (C-Language Integrated Production System), developed by JSC's artificial intelligence section, and draws upon advances in robotics and artificial intelligence.

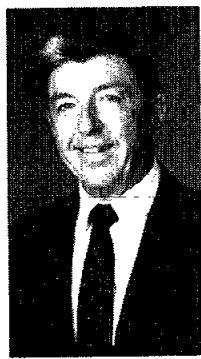
- Artificial intelligence technology also was used in the development of the Intelligent Tutoring System for High School Physics, a computer system that reinforces concepts learned in class.

The system, which uses technology developed for flight controller training, drills the student with physics problems at his or her own pace, providing the teacher with more time for one-on-one instruction.

The system has been introduced to high

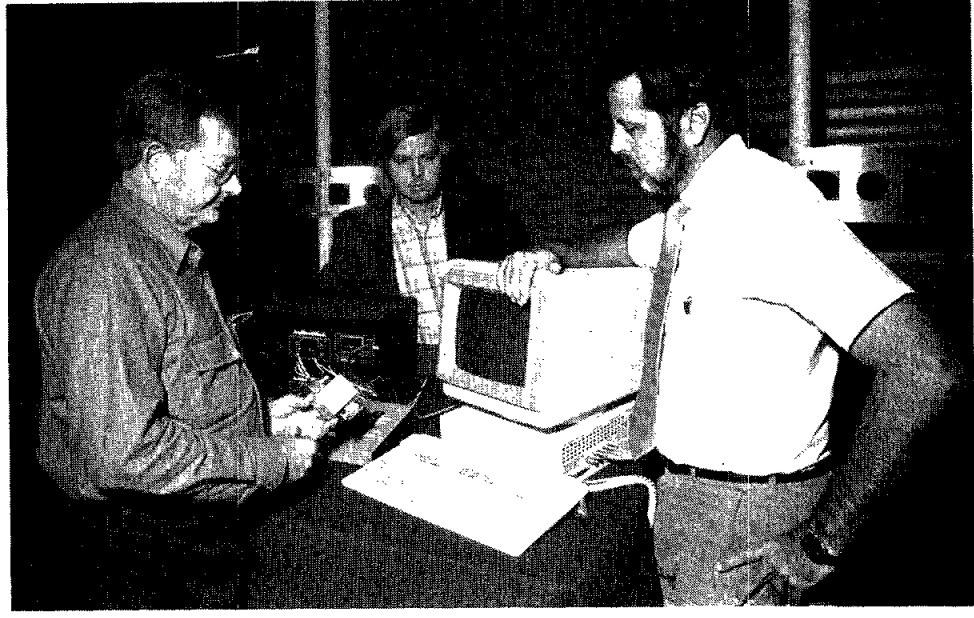


Richard Juday, technical manager for the Low Vision Aid project at JSC, shows how remapping technology can be used to warp images so that people with blind spots can better make use of what vision remains. The aid will consist of a portable spectacle-mounted display, a miniaturized camera input and the remapper. The technology utilization project is aimed at helping people with maculopathy (blind spots), and retinitis pigmentosa (tunnel vision).



These types of transfers not only help a variety of people, they allow the United States to be competitive in the international market.

Dean Glenn, JSC Technology Utilization Officer



Left: Developers of the Locator System for Wandering Individuals include, from left, Jerry Suddath, Charles Bautsch and Dickey Arndt. The system is designed to monitor patients who have a tendency to wander without physically restricting their movement. Far left: Dr. Bowen Loftin, technical monitor for the Intelligent Tutoring System, works with physics students at Clear Creek High School. The system helps free teachers to give more individual instruction.

Computer Expo '90 to feature hardware, software solutions

More than 40 vendors plan displays, demonstrations at day-long event

More than 40 vendors will display mainframe and personal computer hardware and software at the Information Systems Directorate's (ISD) Computer Expo '90 on May 31 at the Gilruth Recreation Center.

The exposition opens at 8:30 a.m. and closes at 5:30 p.m. Several vendors have reserved classroom

space for special seminars, said ISD's Dianne Robinson.

The classes will include demonstrations of the new Lotus 1-2-3 releases, from 8:30-9:30 a.m. in Rm. 204; Control Data's new Enhanced Performance Implementation of UNIX, from 8:30-9:30 a.m. in Rm. 206; Software Publishing's new version of

Harvard Graphics, from 10-11 a.m. in Rm. 204; and Software AG's Integrated Software Architecture, from 10:30-11:30 a.m. in Rm. 206.

Symantec will present an antivirus program and utilities program for Apple Macintosh, from 1-2 p.m. in Rm. 204; Control Data will discuss the practicality of applying UNIX and

ADA to real-time requirements, from 1-2 p.m. in Rm. 206; Quantum Access will present CD-ROM solutions for information management, from 2:30-4:30 p.m. in Rm. 204; and Control Data will show an automated backup system for workstations on Ethernet networks, from 3:30-4:30 p.m. in Rm. 206.

Bus service will be provided from Bldgs. 1, 5, 9, 32 and 45; schedules will be posted in lobbies. Tours of the Help Desk and the Regents Training Facility will be available via bus service from the Rec Center.

For more information, call Robinson at x37595, or Nancy Hawkins at x37601.

Direct Line



By Aaron Cohen

Shuttle-station docking system design sound

(Editor's note: This is the first installment of a column featuring JSC Director Aaron Cohen and Deputy Director Paul J. Weitz. Responses to questions of general interest to center employees will be printed when received in the Director's Office, Code AA. Letters not printed in the Roundup will be answered individually.)

Q: Rumor has it that there are fundamental flaws in the space shuttle to Space Station *Freedom* docking concept. Is this rumor well-founded?

A: If such a rumor exists, it is not because there's any truth to it, but rather because the docking concept is not well understood outside the circle of engineers who have spent years studying and designing it.

Docking the shuttle to *Freedom* is unlike dockings during Gemini, Apollo, Skylab and the Apollo-Soyuz Test Project.

All of our past dockings involved spacecraft that had docking mechanisms and transfer hatches built on their noses, in line with their centers of gravity.

On the shuttle, the payload must occupy the center of gravity, forcing location of the docking hatch 40 feet off the center of gravity. Therefore, a jackknifing rotation is possible at contact, much like the rotation a drifting boat might make if the side of its bow brushed against a stump.

Rather than two craft flying head-on at one another and pushing into hard contact, docking the shuttle with *Freedom* will require a finesse much like that seen in grappling the Long Duration Exposure Facility on STS-32. The docking mechanism must be flexible enough to achieve a lock but stiff enough to immediately stop any rotation.

In addition to the rotation problem, other major concerns that have driven both the proximity operations and the docking system development include: minimizing any contamination of *Freedom* by the shuttle's reaction control system jets; building a system that will work even if the station is unmanned and unpowered; creating a system that adds as little weight as possible to the shuttle; ensuring that the system allows both the space station and shuttle robot arms to be used while the craft are docked; and designing a system that under all of these circumstances is forgiving, reliable and safe.

The current design, called the Docking Mast System, fills all of these requirements. The design involves a retractable, pressurized crew transfer tunnel, about 14 feet long fully extended, on the station. Also aboard *Freedom* is a 28-foot-long mast with a docking fixture at its end. The shuttle carries only a small docking fixture in the payload bay and an adapter for the airlock hatch. However, since these elements include most of the active docking components, they can be checked and verified prior to each flight.

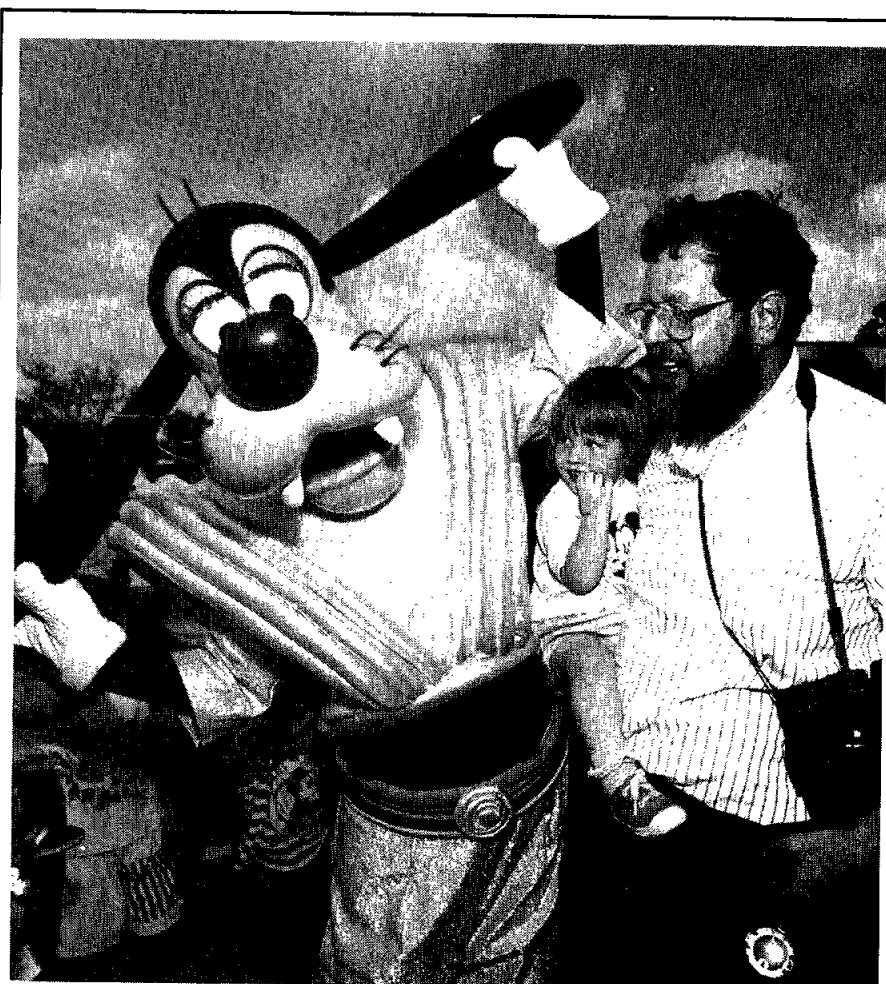
The procedure works much like mooring a boat. The shuttle docks to the fixture at the mast's end, and any rotation is dampened by shock absorbers. The mast then retracts 14 feet into *Freedom*, pulling the shuttle to the crew transfer tunnel. Finally, the transfer tunnel is extended to the airlock hatch; its trunnions are made fast in standard shuttle payload retention latches and a pressure seal is locked in place.

The system is forgiving: the grapple fixtures could be misaligned by more than a foot and still snap into a locked position. It also can handle a wide range of closing velocities. The docking mast is designed to operate even if *Freedom* is unmanned—it can be fully operated from and powered by the shuttle.

The docking mast concept has transferred as much weight as possible to the space station. Over the station's lifetime, this means weight savings of at least 150 tons over alternate designs, 150 tons that can be used for other payloads. In addition, the mast system takes up less room.

The docking mast design has been developed and evaluated over almost five years, and the work has involved experts from all areas of the center. Flight crews have been an indispensable part of the team. Still, it is not perfect. Work is under way on fine-tuning. It has been criticized as overly complex, but it is as simple as all of those involved have been able to make it.

Most importantly, it is innovative and ingenious. It has competed with and come out ahead of a host of other designs for years. A careful design process takes a long time, but it is necessary for our work. Rather than a flawed system, the design of this unique, new docking equipment so far has been exemplary in showing how a large team puts forth its best effort.



JSC Photo by Sherri Dunnette
Lockheed employee Richard Lehman and his daughter, Allison, meet a space-suit clad Goofy at JSC's Child Care Center. Goofy, along with Mickey and Minnie Mouse, visited the center recently when in town with the Mouserrail.

Survey spots areas of concern

(Continued from Page 1)

of Human Resources Director Jack Lister, Safety, Reliability and Quality Assurance Director Charlie Harlan, Flight Crew Operations Director Don Puddy, Engineering Director Henry Pohl and Mission Operations Deputy Director John O'Neill.

Cohen's approval of those strategies was officially conveyed to all directors and program managers this month, Parker said.

"The main point of this activity is to focus effort on areas of particular concern for employees and get their ideas on how to make their organizations better," Parker said. "There's no question people here are motivated, committed to NASA and want to do a good job. The challenge is, how do you shape the organization to take advantage of that?"

In the decision-making area, employees believe that many routine actions require too high a level of approval. They also are concerned with the agency management of the space station program and the elevation of decision-making levels in the shuttle program since the *Challenger* accident. In addition, there is insufficient clarity about roles and responsibilities of line organizations and program/project offices.

The recent center reorganization including the Mission Operations Directorate, Mission Support Directorate and the Engineering Directorate are expected to help address some of these concerns.

Several additional strategies have been identified to deal with these issues, he said. First, each director will be asked to pick three decisions and delegate them down to the next level. Their subordinates will then be encouraged to do the same, creating a trickle-down effect. Directors and managers also are being asked to identify decision-making authorities in other organizations that make accomplishing work more difficult. Also, centerwide teams will continue to review the missions, roles and responsibilities when appropriate.

In the career development area, employees said managers don't discuss careers with their employees as often as employees would like, the center should develop managers' skills in handling career issues, people skills need to be given more weight in selecting managers, and temporary rotational assignments would be

beneficial.

In response to those concerns, several initiatives are planned. First, Human Resources has been assigned to develop and issue a center policy on career development. Second, directors and program managers are being asked to identify one or two good people each year to rotate through another organization for six to 12 months. This particular initiative builds on the successful experiences of Engineering and Mission Operations. A centerwide team will look at making improvements in the management education program. A centerwide team also will look at additional management training for employees interested in becoming supervisors.

As for cooperation and teamwork, the survey results and focus groups showed employees believe that clarity of organizational goals, roles and responsibilities is key, teamwork is hindered by management competition for budget and manpower, and competition for resources hurts intercenter cooperation.

The centerwide reorganization addressed these issues in many areas, and several of the strategies in other areas are expected to have a positive impact on cooperation and teamwork. One separate but related action, development of a plan to standardize electronic voice and data communications throughout the center, has been assigned to the Information Systems Directorate.

With respect to workloads, the survey showed employees believe that a growing share of the workload comes from NASA Headquarters requirements and exercises; unclear goals, roles and responsibilities lead to duplication of effort; many meetings are inefficient; and better distribution of the workload would raise productivity. The primary response to these concerns will be through the decision-making improvement actions as well.

"While our efforts with the culture survey have primarily focused on areas of concern to employees, I feel it is important to remember that the news of the survey was very favorable," Lister said. "People's pride in working for JSC, their level of commitment to high quality work, and satisfaction with both their job and JSC are truly strengths of our culture."

Radio may link Columbia, Mir

(Continued from Page 1)

A number of factors must fall into place before radio communications are possible. If, after launch, *Columbia* and *Mir* are on opposite sides of the Earth, linking the two will be improbable, McFadin said.

Commander Vance Brand, who flew on the Apollo-Soyuz Test Project and who speaks some Russian, will talk with the cosmonauts while Parise operates the radio, Nickel said. Crew members have been asked to notify ground controllers if contact is made.

"If they (the two spacecraft) are in sight of each other, we have a good chance (of making contact)," McFadin said.

Parise will use a hand-held radio for voice communications and a packet radio system for digital communications. When his mission duties prohibit him from receiving transmissions, a robot monitor will respond to operators contacting the orbiter. The robot, which will operate in 12-hour cycles, will respond with a canned message and record what operator made the contact.

Thousands of amateur radio operators are expected to attempt to contact *Columbia*. Parise will talk to as many as possible, but it will be a case of first come, first heard, Nickel said.

The primary pair of frequencies to be used are 145.55 MHz as the downlink for *Columbia* and 144.95 as the uplink.

SAREX has flown previously on STS-9 and STS-51F in different configurations. McFadin said during STS-51F astronaut Tony England conducted more than 1,300 different conversations.

"It's a way the general public can participate in an active space flight," he said. "Most people do not get as close to the space program as we do here. It's very exciting to talk to a person in space."

Cohen opens forum

(Continued from Page 1)

to get to know them and hear what they have to say about our center and how we can improve."

James Sturm and Karl Schuler, the two Human Resources Office employees who have been working with Cohen to design the forum, said a key element of the program is timely recognition of employee achievement. Organizations will be given the flexibility to determine and implement their own screening and selection processes. Ideally, invitations will be given to recent top performers or employees who have contributed to the success of an important project or task, not necessarily to those who have received awards or high performance appraisal ratings in the past.

Periodically, Cohen will send a call letter requesting an updated list of candidates from all directorates and offices.

"We're trying to get away from the big, formal meetings," Schuler said. "This will be high-touch, low-tech."

Space News Roundup

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

Editor Kelly Humphries
Associate Editors Pam Alloway
Kari Fluegel