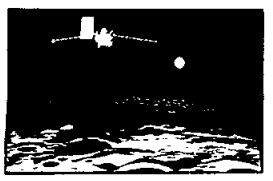
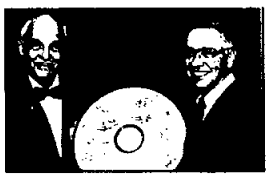
NASA
National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas



New space policy

U.S. space goals clarified, strengthened. Story on Page 3.



50 years young

First 50-year service award presented at JSC. See photo on Page 4.

Space News Roundup

Vol. 28 December 1, 1989 No. 47

Thorson heads space station integration

JSC's Richard A. Thorson, deputy manager for National Space Transportation System Operations, has been appointed deputy program manager for Space Station Freedom Systems Integration.

The appointment, still subject to NASA Administrator Richard H. Truly's approval, follows consolidation of the Offices of Space Flight and Space Station, and the decision to establish the Level II Space Station Integration Office and a JSC Systems Integration Office at JSC.

In announcing the appointment, NASA Acting Associate Administrator for Space Flight William B. Lenoir said Thorson will assume his new job after completing his current space shuttle assignment. Thorson is assigned to NASA Headquarters, but located at JSC.

Lenoir also announced that, effective immediately, Jesse F. Goree Jr., manager for integration in JSC's Space Station Projects Office, will become acting manager of the Systems Integration Office at JSC under Thorson. Goree will lead an office that will consist of about 30 people if JSC's request for the new positions is approved by Headquarters.

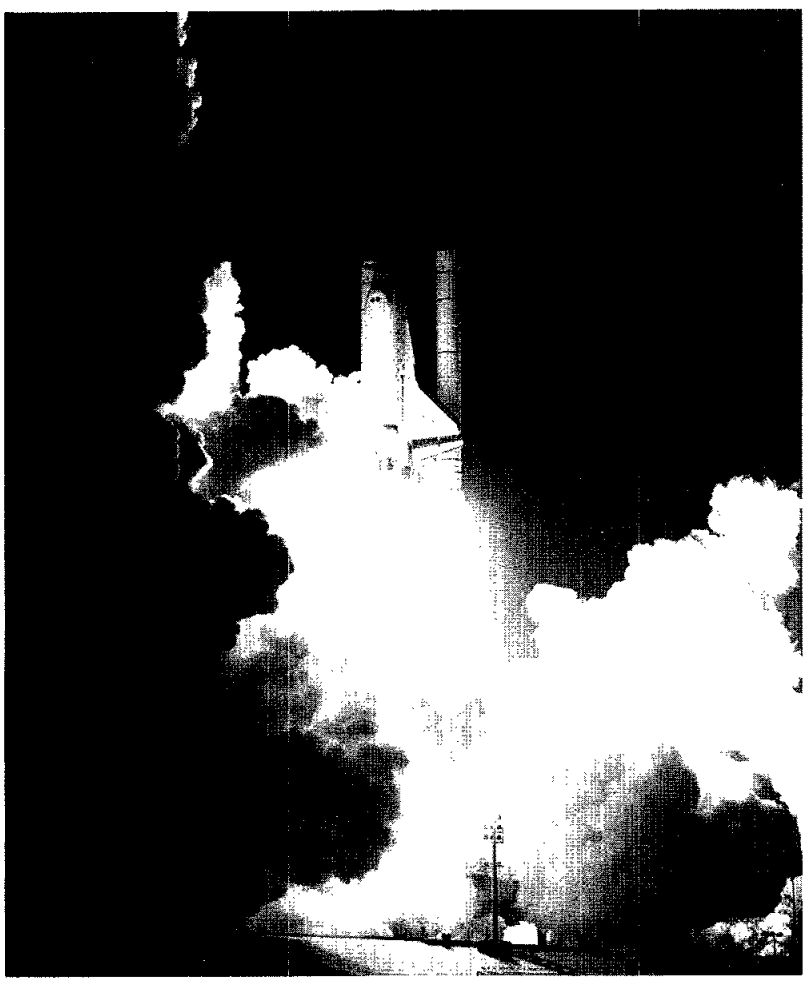
James M. Sisson will serve as manager of the Element Integration Office at Marshall Space Flight Center.

Goree said the main reason for locating the integration offices at JSC and Marshall is to take advantage of the design engineering base that exists at centers, and make the integration work more efficient.

"We are extremely anxious to get on with the integration job both here at JSC and at Marshall," Goree said. "We feel we can provide substantial value to the integration process and the integration products using the institutional bases at JSC and Marshall."

Thorson, who joined JSC in 1966 as an engineer in the Flight Control Division of what is now the

Please see **THORSON**, Page 4



NASA Photo

Discovery lights the night sky as it lifts off the launch pad at Kennedy Space Center on Nov. 22. The orbiter landed at Edwards Air Force Base five days later after a weather delay.

Discovery spends holiday in orbit, returns safely

Discovery painted a golden glow over eastern Florida last week, making the first night shuttle launch in four years, and returned to Earth this week a day late but exceptionally clean.

"We did what we were supposed to do and we did it right," said Commander Fred Gregory upon the crew's 2 a.m. Tuesday homecoming at Ellington Field.

STS-33

Gregory, Pilot John Blaha and Mission Specialists Sonny Carter, Story Musgrave and Kathy Thornton lifted off from Kennedy Space Center's Pad 39B at 6:23 p.m. CST Nov. 22. They made the first shuttle landing on Edwards Air Force Base's runway 04 at 6:30 p.m. CST Monday. Wheels stopped at 6:31:02 p.m.

The landing had been scheduled for the evening before, but strong winds forced a one-day wave-off. The wind continued to be a problem the next day, causing a one-orbit wave-off and the switch to runway 04.

Lead Flight Director Chuck Shaw said the 5-day-7-minute classified Department of Defense mission was almost flawless. "It takes a phenomenal number of people to get a mission to run as smooth as (STS-33) did."

Shaw had special praise for in-flight maintenance expert John Shimp, who was instrumental in coordinating the repairs on *Discovery*'s malfunctioning waste control system, and several other minor repairs that were necessary.

"*Discovery*'s toilet didn't work, but we fixed it," Gregory said after landing.

"We had a near perfect vehicle," Musgrave agreed at Ellington. "We had a great ride; as clean a ship as I've ever seen."

Discovery's processing flow director, Tip Talone, said Tuesday the vehicle is the best post-flight condition he's ever seen.

Please see **RETURN**, Page 4

Wesselski named 'Engineer of the Year'

Clarence J. Wesselski accepted the regional American Institute of Aeronautics and Astronautics (AIAA) award for "Engineer of the Year" for 1989 in ceremonies at the Gilruth Rec Center Thursday, only days after receiving word that he had also been named AIAA's "Engineer of the Year" for 1990 in its national competition. He had received the Houston AIAA section's top engineering award last March.

Wesselski, a JSC design engineer since 1962, won both competitions for his role in designing the crew escape pole. The poles were installed in the middecks of *Discovery, Atlantis,* and *Columbia* after the *Challenger* accident. The retractable device is designed to provide a safe means of escape for shuttle crews under certain flight conditions, such as an aborted launch or before a possible crash landing.

Somewhat surprised at all the attention, Wesselski "really didn't expect it (his entry into the competition) to go that far." In fact, he wasn't even aware his name had been entered until a month or so after the competition deadline, he said.

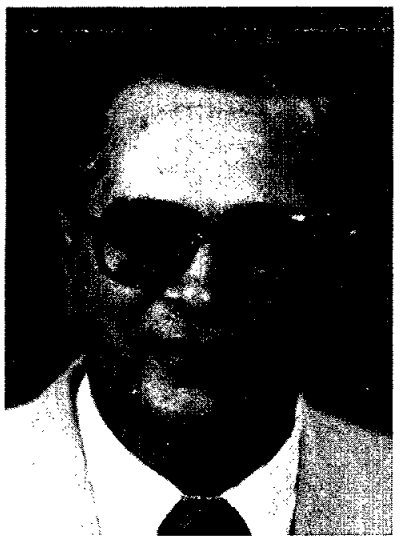
"I understand Engineering Director Henry Pohl nominated me and both Aaron Cohen, and Admiral Truly (all AIAA members), endorsed my nomination," said Wesselski, who has "mixed feelings" about the recognition.

"I appreciate all the support upper management has given the project all the way through, and I'm pleased about winning the awards," he said. "But I'm also a little bit apprehensive, since I'm not a person who is used to, or likes to be, in the public eye."

Wesselski, working in the Structural Design section of the Structures and Mechanics Division, became involved in designing the pole in early 1987.

"There had already been an escape system design program in place for several months," Wesselski explained, "when Winston Goodrich

Please see **AIAA,** Page 4



Columbia readied on 39A

Columbia sits on launch pad 39A for the first time since November 1985 in preparation for liftoff on mission STS-32 to deploy a satellite and retrieve the Long Duration Exposure Facility. *Columbia* was the last orbiter to be launched from pad A since it flew mission 61-C in January 1986.

STS-32

First motion of *Columbia* out to the pad came at 1:32 a.m. CST Tuesday after last minute closeout work was completed. The Mobile Launch Platform with the STS-32 "stack" was hard down at the pad at 8:32 a.m.

Wednesday, the Rotating Service Structure was positioned around the orbiter. Connections between the pad and vehicle were scheduled late that day and early yesterday in preparation for loading the Syncom satellite into *Columbia's* payload bay today.

The countdown demonstration test was to begin yesterday morning at the T minus 24 hour mark leading up to a simulated ignition of the three main engines at 11 a.m. today. The STS-32 flight crew arrived at KSC Monday evening for the pad rollout and for the traditional practice countdown.

Crew for the ten-day mission includes Commander Dan Brandenstein; Pilot Jim Wetherbee and Mission Specialists Bonnie Dunbar, Marsha Ivins and David Low.

Brandenstein, a Navy Captain, is making his third Shuttle flight having flown on STS-8 and 51-G. Dunbar flew as a mission specialist on the German Spacelab mission 61-A. Wetherbee, Ivins and Low will be making their first flights aboard the Shuttle.

Shuttle managers will meet Monday and Tuesday at the launch site to determine the readiness of the vehicle and team to safely conduct the STS-32 mission. At the conclusion of the flight readiness review (FRR) Tuesday, a target launch date will be announced. The current assessed date is December 18 with a launch time of approximately 5:30 p.m. CST.

Work remaining in the pad flow leading toward launch includes the loading of power reactants aboard *Columbia's* orbital maneuvering system (OMS) and reaction control system (RCS) engines. Also remaining is the main engine frequency response test and aft engine compartment closeout work prior to beginning the launch countdown on December 15.

JSC Photo

PIPE FITTERS—Construction contractors from Harrop Construction Co. fit lifting eyes into nine-foot reinforced concrete pipe sections. The section installation is part of the Bldg. 28 Auxiliary Chiller Facility project.

Last NASA unmanned rocket boosts Cosmic Background Explorer

NASA successfully boosted the Cosmic Background Explorer (COBE) satellite into orbit Nov. 18 on the last agency-owned, agency-launched unmanned vehicle.

COBE, which will search for clues to the mystery of how the universe began, rode into orbit atop a Delta rocket from from Vandenberg Air Force Base, Calif., at 8:34 a.m. CST.

By measuring the diffuse infrared radiation (cosmic background) that bombards Earth from every direction, COBE's instruments will help clarify such matters as the nature of the "Big Bang"—the primeval explosion that is believed to have started the expansion of the universe and made it uniform—and the processes leading to the formation of galaxies.

From its orbit 559 miles above Earth, COBE will carry out its cosmic search using three sophisticated instruments: the Differential Microwave Radiometer (DMR), Far Infrared Absolute Spectrophotometer (FIRAS) and Diffuse Infrared Background Experiment (DIRBE).

The DMR will attempt to determine whether the primeval explosion was equally intense in all directions. FIRAS will survey the sky twice during the year-long mission to determine the spectrum (brightness versus wavelength) of the cosmic background radiation from the Big Bang. DIRBE will search for the diffuse glow of the universe beyond our galaxy.

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 1990): $3 each.

Sea World (San Antonio, year long): adults, $17.25; children $14.75. Christmas special: (Dec. 16-Jan. 1, includes snow ski jump and acrobatics and children's snowy play area): $11.

Dickens on the Strand (Dec. 2-3, Galveston): adults, $4; ages 6-12 and 65 and older, $2.

Children's Christmas Party (Dec. 16, 10 a.m.-noon, Gilruth Recreation Center, includes photo with Santa, magician, clown, refreshments): children, $4; adults, $1.

Tennis Invitational—Evert vs. Navratilova (Dec. 9, 7:30 p.m., Summit): $15.

UHCL Festival of Dance (Dec. 3, 8 p.m., Bayou Bldg. Theater): $4.

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. Everyone will be required to 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. 6:30-9:30 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m., Dec. 16 and Jan. 20; cost is $15.

Weight safety—Required for use of the Rec Center weight room. Classes will be 8-9:30 p.m., Nov. 29; cost is $4.

Low-impact aerobics and exercise—Each eight-week session runs twice a week from 5:15-6:15 p.m. Cost is $24.

JSC

Dates & Data

Today

Cafeteria menu—Special: Salisbury steak. Entrees: fried shrimp, deviled crabs, ham steak. Soup: seafood gumbo. Vegetables: buttered carrots, green beans, June peas.

Dec. 3

Christmas Tree Sale—at Gilruth Rec Center, from 1-4 p.m., $17 each, one to a customer.

Christmas Toy Fair—Educational toys demonstrated and for sale at the Gilruth Center, 1-4:30 p.m.; hourly talks by Dr. Diane Kane on quality toys and the value of play; a portion of sale proceeds goes to the JSC Child Care Center.

Monday

Cafeteria menu—Special: hamburger steak. Entrees: beef Burgundy over noodles, fried chicken. Soup: cream of chicken. Vegetables: buttered corn, carrots, green beans.

Tuesday

Cafeteria menu—Special: turkey and dressing. Entrees: baked meatloaf, liver and onions, barbecue spare ribs. Soup: beef noodle. Vegetables: Spanish rice, broccoli, buttered squash.

Wednesday

Cafeteria menu—Special: Spanish macaroni. Entrees: broiled fish, tamales with chili. Soup: seafood gumbo. Vegetables: ranch beans, beets, parsley potatoes.

Thursday

JSC Employee Assistance Program Seminar—Dr. Stephen Pierrel, a local psychologist, will discuss effects of holiday stress in "Are You Singing Those Holiday Blues?," in the Bldg. 30 auditorium; 11:30 a.m.-12:30 p.m. For more information, call x36130.

Cafeteria menu—Special: chicken fried steak. Entrees: beef pot roast, shrimp chop suey, pork chops. Soup: navy bean soup. Vegetables: carrots, cabbage, green beans.

Dec. 8

JSC/EAA Christmas dance—at the Gilruth Rec Center, Dec. 8, 7 p.m.-1 a.m., $15 per person, includes roast beef dinner; tickets available in Bldg. 11.

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

Dec. 9

JSC/EAA Christmas dance—at the Gilruth Rec Center, 7 p.m.-1 a.m., $20 per person, includes prime rib dinner; tickets available in Bldg. 11.

Bay Area Chorus—Performs Christmas carols in Teague Auditorium on Dec. 9 at 8 p.m. The concert is free and open to the public.

Dec. 14

Clear Lake Personnel Association—A lunch and panel discussion on "The Employer's Responsibility in the War on Drugs," at the American Host Hotel, Dec. 14, 11:30 a.m.-2:00 p.m., $12 per person; make reservations by Dec. 5; contact Shirley Jensen, 480-4101.

Dec. 25

Christmas Day—Most JSC offices will be closed and the center will be closed to visitors in observance of the Christmas holiday. The Space News Roundup will not be published Dec. 29.

Swap Shop

Property

Sale/Lease: 10 acres, 1/2 mi. w. of Hwy. 146 on FM 517, barn, util., more. Trey, 280-4381 or 484-7834.

Sale: League City, 3-2 w/1.33 acres, gar./CP comb., deep well, $85,000. 334-1883.

Sale: Kemah lot, 111' x 180', $7,200. 334-1883.

Sale: 60 acres, 3 mi. from Karnes City, TX, on Hwy. 80; El Campo, 2-story house, 1.5 lots. 783-9164.

Sale: Houston County Lake (Crockett, TX), 1.2 acres, stable barn, util. Armstrong, x32975 or 333-3279.

Sale: Friendswood, 2 res. lots, ea. approx. 70' x 185', owner fin. w/10% down. 482-5226.

Rent: Mobile home lot, $85/mo., $50/dep. 488-1758.

Sale: 3-2-2, 5 yrs. old, new paint, Fairmont and Beltway 8 area, $5,000/assume, no credit check. 282-3868 or 487-6757.

Heritage Park: 3-2 corner lot, all appli. furn., W/D, miniblinds, curtains. Roy, 482-1200.

Baywind I-2 BR split plan, 2 parking spaces, refrig., W/D conn., FPL, lg. closets, ex. cond., no pets, $425/mo. plus $200 dep. Mary Paige, 222-1543 or 558-1456.

Sale: Seabrook, 3.29 acres w/2-1 home, $95,000. 532-4784.

Sale: Gulf Meadows, 3-2-2 brick, den w/WBFP, formals, storm wndws., dbl.-insul. ceiling, ceiling fans, screened patio, never flooded, $59,500. 282-4085 or 991-1121.

Sale: 10 mi. from Crockett, TX, 5-yr. old A-frame house on 3 acres, furn., cov. patio, metal bldg., fruit trees, $19,000. 486-9760.

Sale: Shoreacres, 4-2-2, 1,800 sq. ft., lg. wooded lot, assum. FHA loan. Sally, x37485 or 488-5501.

Sale: League City, 2.06 acres, city water and sewer avail., $39,950. 554-6695.

Sale: CLC/Bay Forest, 1-story Perry home, approx. 2,040 sq. ft., brick, 2-2, study, built-ins, FPL, whirlpool tub, 2-car det. gar., $136,500. 488-0945.

Lease: Texas City condo, lg. 1-1, W/D, FPL, cov. parking, sec. gates, pool, $315/mo. 282-2715 or 554-4974.

Sale: Seabrook, 3-2-2, 1,800 sq. ft., brick, never flooded, formals, lg. den w/FPL, new A/CH, roof, int., deck w/spa, $0 down, $69,900. Richard, x30271 or 474-9334.

Sale: Heritage Park, 3-2-2, qual. bond buyer pays $3,500 move in, we pay closing costs, decking, sec. sys. Linda, 282-5241 or 996-1990.

Sale: Taylor Lake Estates, 90' x 135' lot, $36,500. Don, x38039 or 333-3313.

Sale: Lake Livingston, 70' x 140' lot, Stephens Hills area, water, elec., BO. 488-5445.

Lease: Lakeshore condo, 2-2, $600. x36449 or 474-7883.

Lease: El Lago condo, 1-1, mirrored walls, miniblinds/verticals, W/D, 650 sq. ft., $330/mo. Lindemann, 488-3300 or 532-2218.

Rent: Bal Harbour townhouse, 3BR, atrium, boat slip, 3 min. from JSC, $1,200/mo. 486-8659.

Lease: Webster condo, 2-2, W/D, FPL, ceiling fans, no pets, $450/mo. plus dep. 485-6021.

Sale/Lease: Texas A&M townhome, lg. 2-1, walk to campus, $38,000, BO. (713) 333-4182.

Rent: Mobile home lot, Hwy. 3, Dickinson, 5 mi. from NASA Rd. 1, $90/mo. 332-00365.

Lease: Kirkwood South, 4-2-2D, sep. DR, paneled den, gas util., fen., $550/mo. 482-6609.

Lease: Heritage Park, 4-2-2, ceiling fans, split BR, fen., $550/mo. 482-6609.

Lease: 4-2-2, near Dobie H.S., formals, FPL, miniblinds,fans, $610/mo., equal dep. Chris, 484-1495.

Sale: Friendswood, 4-2.5-2, 2,700 sq. ft., less than 4 yrs. old, assume 9% FHA, no approval, w/$23,000 equity or buy, $110,500. Wade, 333-6567 or 482-7982.

Lease: Oakbrook, 3-2-2, 2,180 sq. ft., formal DR, remod. kitch., skylights, miniblinds, fen. yd., avail. Jan. 10, $1,000/mo. plus dep. Joyce, 282-3452 or 480-2478.

Sale: Country Restaurant, well estab. w/3 BR home, 3 acres, pecan trees, W. of Houston, $175,000. Gene, x33016 or (409) 732-6321.

Cars & Trucks

'82 Citation V-6, auto., A/C, PW, AM/FM cass., maint. sched., $1,650, OBO. Bruce, 485-0396.

'86 Nissan 300ZX, auto., T-tops, 15K mi., new tires, $12,500. Mary, x32976 or 486-1766.

'84 Honda Civic, 4-dr. sedan, auto., A/C, AM/FM/cass., ex. cond., $4,850. Vic, 334-2335 or 282-3216.

'77 Corvette, 350 auto., T-tops, needs work, $3,800. 480-3909.

'86 Nissan 300ZX, T-top, pwr. pkg., alloy wheels, new batt. and alt., $7,000. Mason, x30277 or 332-7092.

'77 Toyota Corolla, A/C, good stereo, $600, OBO. Fred, x30770 or 480-6951.

'77 Camaro, looks good, runs good, $1,500. 474-2200.

'69 Camaro, orig. reb. 327/350 turbo trans., w/shift kit, A/C, PS, PB, dual exh. hdrs., alarm, $5,500, OBO. Joyce, x37261 or 721-0601.

'85 Chrysler La Baron, 2-dr., AM/FM stereo, cass., elec. dr./wdws., turbo eng., cruise, 52K mi. Jennifer, x34194 or 280-0993.

'81 Ford Courier PU, runs good, $600. Ed, x39847 or 559-1215.

'81 VW camper, new eng., ex. cond. ins./out, stove, refrig., sleeps 4. $4,000. 280-8648.

'84 Pontiac Bonneville Brougham, ex. cond., PS, auto., stereo/tape, PL, cruise, wire wheel covers, tilt, 76K mi., bl. bk. $4,650. 474-2384.

'86 Celica, mint cond., loaded, pwr. moon roof, stereo/tape, pwr. pkg., 39K mi., $9,600. 474-2384.

'89 Honda Civic 2-dr., auto., A/C, cass., 10K mi., $8,950. 333-7180 or 561-7182.

'79 Mercury Monarch, 4-dr., V-6, 127K mi., A/C, $600 cash. Lee, x31621 or 486-1423.

'83 Toyota Tercel SR5, 3-dr. liftback, A/C, PS, PB, pwr. sun roof, 5-spd., AM/FM/cass., 90K mi., was $2,475, now $1,750, OBO. 464-8694.

'79 Olds Cutlass wagon, low mi., new tires and brakes, stereo, good cond., $1,300, OBO. 280-9822.

'73 Datsun 240Z, 91K mi., $1,500, OBO. Mike, x32808 or 532-1051.

'80 Toyota Corolla wagon, AC, 5-spd., FM stereo/cass., new tires, 79K mi., $1,795. Jeff, x31794 or 538-1307.

'77 Dodger Maxi van, mini R.V., self-contained, 56K mi., BO. Kinzler, 326-2449.

'87 Isuzu Imark, hatchb., loaded, 40K mi., ex. cond., $4,200, OBO. 480-4814.

'85 MR2, loaded, 5-spd., tail fin, $6,500. Youm Nguyen, x32142 or Cindy, 779-4515.

'86 VW Jetta GLI, 4-dr., loaded, $5,950. x38674 or 332-2271.

14' x 70' mobile home, 2-2, neat, curtains/miniblinds, assume loan of $126,000. 534-4770.

'86 Ford Mustang GT, loaded, 29K mi., 5-spd., AC, PW, cruise, stereo cass., $11,700. 488-2258.

'79 Dodge Omni, 2-dr. hatchb., 5-spd., runs good, $1,000. Bob, x39079 or 488-5881.

'88 Chrysler Conquest (Mitsubishi Starion), 8K mi., 5-spd., sports pkg., A/C, 188hp, 6-spkr. stereo, $10,350. 280-1335 or 488-0945.

'72 Fiat Spyder convert., ex. cond., stereo, reb. eng., new brakes. 488-2941.

'88 Hyundai Excel, 5-dr. hatchb., AM/FM cass., cruise, $4,500. Susan, x37424 or Pam, 480-8259.

'85 Cadillac Fleetwood FWD, 25 mi./gal., 64K mi., $9,500, OBO. Tom, x38298 or 488-4089.

'85 Ford EXP, 2-dr., 5-spd. hatchb., good cond., $1,800, nego. x34779 or 947-2317.

'75 Buick convert., LaSabre, all pwr., AC, $2,800. Don, x31721 or 480-2109.

'79 Chevette, 120K mi., runs ok. Bob, x38691.

'64 Willys jeep, reb. trans., new brakes, $3,000. 488-2538.

'84 Honda Civic 4-dr. sedan, auto., A/C, AM/FM/cass., ex. cond., $4,850. Vic, 334-2335 or 282-3216.

'82 Mazda 626, auto., AC, cruise, AM/FM cass., good cond. 280-4344 or 481-9702.

'79 Honda Civic, 4-spd., new tires, exh. sys., clutch, CV joints, struts, reb. eng., AM/FM cass., 37mpg, $1,195. 896-1035.

'84 Chevy Celebrity, 4-dr., auto., A/C, PW, PD, PL, cruise, tilt, AM/FM, $3,500. Edward, x36250 or 481-4889.

'71 Buick Electra 225, runs good, $600. 532-2000.

'85 Mitsubishi Cordia-turbo, 3-dr. hatchb., 5-spd., AC, AM/FM cass., sunroof, $3,990, OBO. x31299 or 333-1073.

'80 elec. car, "Comuta-Car", 40 mi., range, 38mph cruising, licensed and inspected, on-board charger, $1,950. 532-4784.

'83 jeep, ex. cond., new top and tires, low mi., $5,100. Brian, 333-7315 or 480-5430.

'81 Chevy Caprice Classic, 4-dr. sedan, ex. cond., AM/FM, AC, cruise, new tires, $2,000. 282-3452 or 480-2478.

'85 Chev. C-10 PU, AC, PS, PB, AT, dual tanks, V-8, $3,700. 482-7005.

Cycles

'79 Suzuki wetbike, 44.1 cu. in., 50hp, new batt., trlr., ex. cond., $950. 333-6119 or 326-1254.

'83 Honda XL 600, runs good, street legal, $625. Brad, 485-2101.

Yamaha 80, $125; 2 Penn Phantom Master downriggers w/wt. and mts., $200/both. 339-1957.

'85 Honda Elite, 80cc scooter, like new, 8K, $600. 484-1814.

Boats & Planes

13' AMF Zuma sail boat w/trlr., $850. Ted Guillory, 480-2367.

'78 Renken 19' Bowrider, 170hp fresh wtr. cooled Merc. I/O, galv. EZ loader trlr., depth finder, runs great, $3,900. 532-3515.

14' O'Day day sailer, 3 sails, trlr., $800. Don, x31721 or 480-2109.

'87 18' Celebrity Bowrider, 183VBR, 165hp I/O, SS prop, full teak swim platform, tilt/trim, cov., bimini, Sportsman trlr., mint cond. 333-1640.

15' Tidecraft boat w/trlr., 50hp Merc. and Super Motorguide trolling motor, rigged w/dry stor., carpet, etc., $1,200, OBO. 488-4453.

'67 Falcon boat, 16', deep-V, 40hp Johnson, runs well, good fishing boat; '74 Sportsman trlr., many new parts, $850. x30878 or 996-6418.

16' Hobie Cat., trlr., equip. w/sailbox, $1,000. Joe, x38496 or 480-6975.

Audiovisual & Computer

Apple II plus PC clone w/mono monitor, MEM exp., joystick, 80-col card, 2 floppy drives, S/W plus Docs incl. dBASE II, Fortran, Pascal, Wordstar, CPM, Visicalc, Print Shop, many more, $500. Larry, 282-3161 or 996-1013.

Clarion/SAAB AM/FM/cass. stereo and 7-band Graphic Equalizer, loaded, 80W, DNR, Dolby B&C, metal tape, anti-theft, incl. manual and mtng. brackets, was $1,400, now $700, OBO. Mike, x39095 or 333-5387.

IBM AT clone, 2 meg. RAM, 1 ser., 1 par., 70m HD, VGA adapter, EGA monitor, 101 keybd. 486-5731.

Video Camcorder sys. w/tripod, light, carrying case, etc., $1,000. 484-9183.

IBM/XT compat., port., 640K, Hercules Graphics, amber monitor, (1) 5.25 (360K) floppy drive, (2) 30m HD, 1200 baud modems, $1,000. 996-6932.

HP Plotter, mod. 9872A, 5 pin, HPIF interface, $200; Sprint 5 13 bit Daisy Wheel printer, wide carr., $200. Ellenda, x31305 or 471-5760.

Turbo Pascal pro. compiler by Borland w/OOP, latest version S.S., new, $129. Jeff, x31974 or 997-1538.

Osborne port. CP/M, 2 5 1/4" floppy drives, modem, ext. monitor, and 80-col. upgrade, software incl., $175, OBO. 326-1278.

Household

Fischer 25" console TV, stereo/bilingual, rem. cont., cable-ready, $600, OBO. 376-6865.

Drop-leaf table, $150; drsr. w/beveled mirror, $145; desk, $195; washstand, $185; curio cab., $189; lg. wardrobe, $119. 283-5616 or 488-3595.

Oriental pagoda display cab., 23" h by 20" w by 11" d, blk. lacquer, $350; 4 Ronnie Wells paintings, Wyeth style, country scenes, $450-$650/ea. x36358.

31" blond mahog. drum table, leather top, tripod legs, $350; oriental chest, 3 drwrs., blk. lacquer, top lifts up, compart. w/doors, $250. x36358.

Kenmore fullsz. W/D, $200. 484-6261.

Kingsz. wtrbd. w/drwrs., semi-motionless, pads/heater, new, $600. Laura, x31312.

Rocking chr., dk. wood, cushions, $75. x39588 or 487-1883.

Antique oak armoire and drsr., $600/both; antique Amer. pine dbl. bed w/new matt. set, never used, $900. 996-1442.

Desk, white modular, 2 shelf units, one 4-drwr. unit, $400; 5 cherry coffee table, oval, $150. x59528 or 482-0909.

DR set, walnut w/glass top table, 4 brass chairs w/cloth seats, $65. Loring, 282-2808 or 332-7137.

Sofa, brn., comfort., contemp., $100, OBO. 488-6521.

BR set, full bed w/bkcs. hdbd., 6-drwr. drsr., wall mirr., 5-drwr. desk w/antique white/blue, $300. x38163 or 486-0830.

Kingsz. bed, $100, nego. Glenn, x38825 or 487-8018.

Uphol. bar stools, 30" high; writing desk; office-style end tables and chairs; contemp. easy chair w/ottoman. Tom, x31418 or 863-7561.

12" tricycle, $10; Sears foam crib matt., $10; wood 4-wheeler radio flyer, $5; Totrider carseat (booster), $5; chrome and glass DR light, $25. 486-4747.

3-pc. LR set, velour, flower des., beige/brn./blue, $150; RCA 25" color console TV, dk. wood, $75. Jana, x31653 or 326-4030.

Carpet, med. brn., over 30 sq. yds., $120; gas water heater, 40 gal., $20; Sharp carousel microwave, $30. Bob, 482-5984.

84" sofa, 3 cushion (rever.), toss pillows, lt. green w/rust and yellow flowers, $230. Bob, 482-5984.

Kenmore W/D, fullsz., will del., $100/both. Wally, x36440 or 326-2664.

Solid oak DR set, 6 chairs, buffet, $500. 554-2085.

Queensz. sleeper sofa and loveseat, green/gold/orange velvet, $100, OBO; 3-pc. orange chairs and ottoman, $35, OBO; wooden rocking chair, $15, OBO. 282-4149.

Buckeye maple dbl. bed, $225, OBO; dbl. bed w/hdbd., $200, OBO; coffee table, $75; lamp, $30. Joey, x39233 or 482-7265.

Camel colored w/designs, $60. Ed, x36250.

4-pc. Bassett BR set, trpl. drsr. w/mirr., 4-drwr. chest, nightstand, dbl. bed hdbd. w/frame, solid wood w/walnut finish, $175. x35266 or 333-5685.

Lost & Found

Lost, reward, blk. poodle (Woochie), last seen at Barringer Knoll Condos by Hwy. 3. 283-5616 or 488-3595.

Lost, reward, white lace pin, has sentimental value, lost 11/14/89. Jeannette, x35816 or 488-2509.

Photographic

Nikkormat EL 35mm cam. w/Soligor 35-140mm f3.5 and macro lens, Soligor MK-30A flash w/2 auto. ranges, zoom, new bag, access. Mike, x37777.

Pets & Livestock

Baby hand-fed cockatiels, 5 wks. old. Linda, 484-7834.

Free kittens. Kelley, 283-5466 or 488-8194.

Springer Spaniel/blk. Lab pups, good Springer markings, tails docked, born Oct. 18, $25. Steve, x36725.

Doberman pups, born 8/20/89, blk. and red, tails and duclaws rem., wormed, sire and dame on premises, $100/ea. Merrell, x37570.

Free dog, lg., gray, shaggy, 2 yrs. old, male, neutered. x39121 or 489-1701.

Chows, born 10/18/89, full-bld., no papers, wrinkled faces, blk., M&F, $125; red male, $150. 475-2357 or x37815.

AKC Siberian Husky pups, blue-eyed, 2 blk./white males, 1 brn./white fem., born 10/1/89, $200. Tom, x38696.

Cockapoo pups, blk., reg., parents on premises, $75/ea. x30852 or 996-0981.

1 yr. old half Golden Ret. fem., all shots. John, 334-3422 or x31929.

Mini. Schnauzer AKC pups, born 10/18/89, lt. salt and pepper, tails/duclaws rem., shots, $275. 996-6826.

Zebra Finches, $5; Pied white doves, $5; guinnea pigs, $5. 282-3750.

Wanted

CLC symphony violinist looking for folk/country/cajun group to play with. 486-6988.

BR and BA for rent in 2-yr.-old Bay Glen home, W/D, FPL, micro., DW, pool, tennis, etc., $250/mo., util. nego. 486-6988.

Want used Ethan Allen furn., prefer Heritage, circa 1776, Country Craftsman. Gloria, x39802 or 998-9168.

Want Starwars spaceships, toys, fig., and books. Ron, 482-1385.

Want '77 thru '81 Honda Accord for parts. 484-9183.

Want someone to help me repair hdwr. problems w/IBM PC/XT. 332-0365 or 282-2802.

Want chain link fen., 5-ft. or 6-ft. high, I will take dwn.; 10x12 stor. bldg.; usable materials for util./livestock shed, poles, lumber, corrigated roofing, etc. Martha, x39350 or 473-4433.

Need someone to carpool w/from Lake Jackson/Angleton area. x30918 or (409) 297-7038.

Want riders for car pool from I-10/Hwy. 6 Park and Ride to JSC/CL area, wk. hrs. 7:30 a.m.-4 p.m. x31810.

Want longboard type surfboard, approx. 8' or 9' long, old style. Billy, x31339 or 534-4780.

Want children's playhouse, plas.; children's plas. picnic table, slide, see-saw, sandbox, etc. LeAnne, 486-8463.

Want roommate, 3/2/2, no children or pets, have own BA and BR, Fairmont at Beltway 8. Susan, 282-3868 or 487-6757.

Want someone to share cottage, off Egret Bay Blvd., $210/mo. plus 1/2 util. Rick Davis, x36042 or 332-7695.

Want slide projector. Vincent, 335-7341 or 333-3577.

Musical Instruments

ARBOR elec. guitar, orange, $175. Jim, 554-4109 or 332-0293.

Fender concert amp, tube type, one 12" spkr., $325; Ibanez hot foot distortion pedal, $80; Gibson-Epiphone Emperor jazz guitar, $900. Ed, 896-1035.

Snare drum w/stand, extra stand, BO. Sue, 480-5027.

Antique English organ, $2,500, OBO. x34966 or 326-1529.

Ovation guitar w/hd. case, $565. x34205 or 488-8105.

Piano, Wurlitzer Spinette, ebony finish w/bench, $475, OBO. 376-6865.

Personal

To the man in Alvin who bought the FPL from Pepper (in Bacliff), I have some more insulating tubing for you. 333-6558 or 339-1337.

Miscellaneous

Kimball organ, $50; Shredder/Mulcher w/5hp eng., used 25 hrs., $20. x31172 or 332-2089.

Upright piano; contemp. sofa, loveseat, matching DR set; drsr., desk. 538-3180.

4 Toyota Celica GTS rims, '86 mod., 5-lug, 5-100s, $250, OBO; 4 alloy blk. mesh Amer. Racing rims, 5-lug, 5-100s, used one mo., $300, OBO. Rick, 280-1500 x3323 or 996-8961.

Snow skis, Head 160's, 8 1/2 boot, Salomon Step-In bindings, incl. poles/ski tote, $150; pr. Hitachi stereo spkrs., $40; kitch. table w/insert and 6 chairs, $75; BR drsr. and desk, $200. 996-1442.

Surfboard/wave-riding vehicles, w/hood rack, $50. Sharon, 480-2646.

Bike rack, $10. Sharon, 480-2646.

SAAB trlr. hitch for SAAB 900, used 6 mos., incl. instruct., $70, OBO. Mike, x39095 or 333-5387.

4-pc. LR set, Earth tone, $300; 1 den chair, $25; 3 rattan chairs, $25; exer. bike, $10. 332-4774.

Heathkit 25" color TV (console) w/manuals, trouble-shooting kit, test equip, $125, OBO; Sears exer. bike, $25. Larry, 282-3161 or 996-1013.

Ladies' coats, sz. 6, blk. wool, $50; red wool half, $30; brick half, $20; green/blue checker, $25; beige trench, $50. 332-4774.

Bic windsurfer, 2 sets of sails, $162.50. 480-6975.

Black & Decker 7"/9" wildcat rt. angle sander/grinder, Mod. 4076, 3.3hp, 6000rpm, 15 lb., $100. 921-7212.

Mink jacket, $750. 921-7212.

Go cart, 5hp eng., $225. Steve, x36725.

Camper top for long-bed PU truck, $75, OBO. Mike G., 480-2067 or 488-5921.

Aquariums, 10 gal. w/undergravel and lt., 20 gal. w/undergravel, lt. and pump, $50/both or trade for lg. mech. filter. Mike G., 480-2067 or 488-5921.

FPL screen, antique brass, glass door, $35; Clairol foot fixer, $15, port. shower stall and fixtures, $30; Regina carpet steamer, $30. Andy, 280-2295.

Moving boxes and packing material, 10 wardrobe boxes, assort. szs., $40, wardrobe boxes $3.20/ea. sep. Andy, 280-2295.

Lawn mower, 22", $80; Sears edger, $160. x59528 or 482-0909.

TV antenna, outdoor type w/8" pole, $25. x39588 or 487-1883.

Egg incubator, used one time, $25. 280-2039.

DP workout bench w/weights, used 2 mos., $50. 280-2039.

16' car trlr., flat bed, dbl. axle, lights, springs, licensed, ramps, $800, OBO. Bruce, 485-0396.

3-dr. drsr., yellow, $25; rec. chair, $50; kitch. DR tbl. and 6 chairs, wood, $50; scuba gear, regulator and B.C., $100; steel tank, $50; dkrm. equip., enl. and more, $50. x37188.

'88 Sears riding mower, 12hp, 38", $750, OBO. x31363 or 479-5594.

Trap Shooter II radar det., $50; 20" girls bicycle, $75. Joe, x38851 or 944-7042.

Interarms 38 special, 5-shot revolver, $70. Nathan, x30180.

A/C comp., 3.5 ton, carrier, 2 yrs. old, $75. x34557 or 485-1541.

3-pc. wool suit, 44 tall, dk. blue pin stripe, hand-tailored, worn only twice, $65. x34557 or 485-1541.

Vol. 1, Issue 1, through current Roundups, BO 1 wk. from issue. 488-4372.

Radio control cars, Tamiya Bigfoot w/Futaba radio, CO2 powered German built car w/cont., toy Trans Am w/ctrler., all for $230. x30521 or 480-9880.

Strawberry Shortcake doll coll., extras, 3' tall house, furn., 20 dolls w/clothes, trolley, gazebo, bikes, patio furn., $250. 473-1000.

Antique mahog. BR suite; stand. sz. bed, 4-dr. chest w/mirr., 5-dr. drsr. w/mirror; mahog. 18th cen. corner chair; GE color console TV; RCA VHS rec.; ans. machine; misc. items, BO on indiv. items. Pat, 480-4431 or 333-7235.

FE-400 Furuno chart rec., depth finder, fish locator, $100, OBO. x38825 or 487-8018.

Elem. school desks, $5. 946-5957.

Rolls-Royce wheel chair, $200; bath trans. seat, $50, quad cane, $20; walker, $35, used approx 2 mos. Kathy, x38193.

Bell Pro-Star motorcycle helmet, red/white/blue design w/visor, $90. x31588 or 488-1326.

Ceiling fan lt. kits, polished brass/glass w/4 lamps ea. kit, $19/kit. Bob, 283-5469 or 484-0898.

Magic Chef dbl. gas oven w/built-in rotis., $200. 339-1957.

Chain saw, gas Dayton/Poulan, 17", $100. 486-8266.

Fred Bear Bow, 40 lb. Kodiak Hunter recurve, $80. 333-3071.

Bumper pool tbl., access., convert. for cards and dining, $175. Kinzler, 326-2449.

Scuba mask, dacor, 3-view, red. Youm Nguyen, x32142.

24", 4mm, diamond-cut, 14K rope chain, matching 7", 4mm, D-C rope bracelet w/total wt., 32.6 grams, $390. 996-8608.

Wedding veil, pearl forehead piece, finger tip length, $40; diamond ring, 45 pt. TW diamonds, $275. 996-8608.

'86 Hogan Apex irons only (2-PW), Hogan staff bag. x32780.

Stereo spkrs., realistic Optimus T-100, $125. x34256.

Carrier for lg. dog, $10; lg. wash tub, $5. x32662.

Set of Nancy Drew bks., 1-35 in series, BO; Baby Rock 2400 sewing mach., BO; wooden bucket lamp, $35; Onyx chess set, incl. board and carrying case, BO. Fritz, x34034 or 554-4337.

Karate uniform w/kick shoes, $10; heavy duty punch bag, $25; boxing gloves, $5; Russian basic course in 30 vol., $12. Nina, x31612 or 488-0664.

Peg sheets, $2; boy's 20" bike, $20; cane uphol. dining chairs, $20; solid oak sm. dining tbl., $25; cocktail tbl., $25. Nina, x31612 or 488-0664.

Windows, lt. fix., decor. cab. hdwr. and door hdwr. Don, x38039 or 333-3313.

CB home antenna w/50' coax cable, $15, OBO. 488-5445 or 333-6533.

Staghorn fern, lg., in hanging basket, $50. Elaine. x32075 or 488-3433.

One-way ticket to San Jose, CA, Dec. 23, $100. Deana, 280-0151 or 280-1500, x3647.

Mobile home elec. htr., 75k BTU, closet unit, $100, OBO; 6k BTU Sears Kenmore wdw. A/C, 110v, $50; 11k BTU Sears Kenmore wdw. A/C, 110v, $100. 333-6558 or 339-1337.

Tire, C78-14, whitewall, $20. Bob, x39226 or 532-3179.

Nintendo action set, 2 extra games, $100, OBO. 554-2085.

Knitting mach., studio 360, w/ribbing attach., Intarsia and lace carriage, yarn changer, patterns, and punch cards, all for $600. (409) 925-8290.

Sears Craftsman adv. timing lt., Mod. 161.2194, $50. Tom Clark, x39842.

Trlr., 16' low-boy, dual solid axle w/ramps, new treated bed, $350. Wally, x36440 or 326-2664.

9'x12' beige carpeting, $20; twin bed frame/matt., $30; dbl. bed frame only, $10. Steve, x34176 or 486-8424.

Rem. cont. car galloper, parts, and extras, $100 OBO. Jim, 554-4109 or 332-0293.

Ford mags (2) '60's model, 14" tires w/rims, $50. Jim, 554-4109 or 332-0293.

Wheelchair, wooden; sewing mach.; rec. player; vice; walking plow; iron bed; 1847 Wm. Rogers Silverplate, 56 pc., 7 extra, serv. for 8. 783-9164.

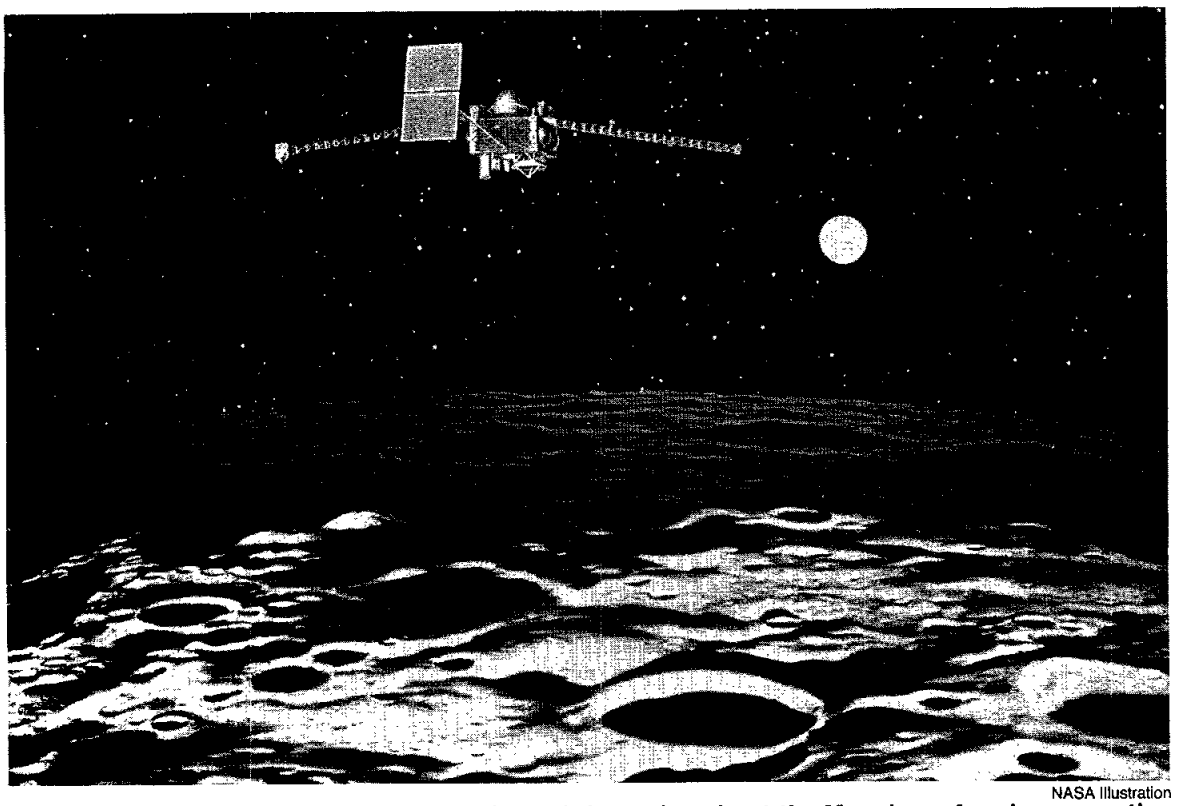
New space policy updates, reaffirms goals

Changes affect remote sensing, space debris, space station

(Editor's note: This is the first installment in a two-part collection of excerpts from President George Bush's revised national space policy. Part 2 will be presented next week.)

On Nov. 2, 1989, the President approved a national space policy that updates and reaffirms U.S. goals and activities in space. The updated policy is the result of a review undertaken by the National Space Council. The revisions clarify, strengthen, and streamline selected aspects of the policy. Areas affected include civil and commercial remote sensing, space transportation, space debris, federal subsidies of commercial space activities, and Space Station *Freedom*.

Overall, the President's newly issued national space policy revalidates the ongoing direction of U.S. space efforts and provides a broad policy framework to guide future U.S. space activities.



NASA Illustration

In this artist's concept, a lunar orbiter collects information about the Moon's surface in preparation for establishment of a permanent outpost.

National Space Policy

United States space activities are conducted by three separate and distinct sectors: two strongly interacting governmental sectors (Civil and National Security) and a separate, non-governmental Commercial Sector. Close coordination, cooperation, and technology and information exchange will be maintained among these sectors to avoid unnecessary duplication and promote attainment of U.S. space goals.

Goals and Principles

A fundamental objective guiding U.S. space activities has been, and continues to be, space leadership. Leadership in an increasingly competitive international environment, does not require U.S. preeminence in all areas and disciplines of space enterprise. It does require U.S. preeminence in the key areas of space activity critical to achieving our national security, scientific, technical, economic, and foreign policy goals.

- The overall goals of U.S. space activities are: (1) to strengthen the security of the U.S.; (2) to obtain scientific, technological and economic benefits for the general population and to improve the quality of life on Earth through space-related activities; (3) to encourage continuing U.S. private-sector investment in space and related activities; (4) to promote international cooperative activities taking into account U.S. national security, foreign policy, scientific, and economic interests; (5) to cooperate with other nations in maintaining the freedom of space for all activities that enhance the security and welfare of mankind; and, as a long-range goal; (6) to expand human presence and activity beyond Earth orbit into the solar system.

- U.S. space activities shall be conducted in accordance with the following principles:

—The U.S. is committed to the exploration and use of outer space by all nations for peaceful purposes and for the benefit for all mankind. "Peaceful purposes" allow for activities in pursuit of national security goals.

—The U.S. will pursue activities in space in support of its inherent right of self defense and its defense commitments to its allies.

—The U.S. rejects any claims to sovereignty by any nation over outer space or celestial bodies, and rejects any limitations on the fundamental right of sovereign nations to acquire data from space.

—The U.S. considers the space systems of any nation to be national property with the right of passage through and operations in space without interference. Purposeful interference with space systems shall be viewed as an infringement on sovereign rights.

—The U.S. shall encourage and not preclude the commercial use and exploitation of space technologies and systems for national economic benefit. These commercial activities must be consistent with national security interests, and international and domestic legal obligations.

—The U.S. will, as a matter of policy, pursue its commercial space objectives without the use of direct federal subsidies.

—The U.S. shall encourage other countries to engage in free and fair trade in commercial space goods and services.

—The U.S. will conduct international cooperative space-related activities that are expected to achieve sufficient scientific, political, economic, or national security benefits for the nation. The U.S. will seek mutually beneficial international participation in space and space-related programs.

Civil Space Policy

- The U.S. civil space sector activities shall contribute significantly to enhancing the nation's science, technology, economy, pride, sense of well being and direction, as well as U.S. world prestige and leadership. Civil sector activities shall comprise a balanced strategy of research, development, operations, and technology for science, exploration, and appropriate applications.

- The objectives of the U.S. civil space activities shall be (1) to expand knowledge of the Earth, its environment, the solar system and the universe; (2) to create new opportunities for use of the space environment through the conduct of appropriate research and experimentation in advanced technology and systems; (3) to develop space technology for civil applications and, wherever appropriate, make such technology available to the commercial sector; (4) to preserve the U.S. preeminence in critical aspects of space science, applications, technology, and manned space flight; (5) to establish a permanently manned presence in space; and (6) to engage in international cooperative efforts that further U.S. overall space goals.

Commercial Space Policy

The U.S. government shall not preclude or deter the continuing development of a separate non-governmental Commercial Space Sector. Expanding private sector investment in space by the market-driven Commercial Sector generates economic benefits for the Nation and supports governmental Space Sectors with an increasing range of space goods and services. Governmental Space Sectors shall purchase commercially available space goods and services to the fullest extent feasible and shall not conduct activities with potential commercial applications that preclude or deter Commercial Sector space activities except for national security or public safety reasons. Commercial Sector space activities shall be supervised or regulated only to the extent required by law, national security, international obligations, and public safety.

National Security Space Policy

The U.S. will conduct those activities in space that are necessary to national defense. Space activities will contribute to national security objectives by (1) deterring, or if necessary, defending against enemy attack; (2) assuring that forces of hostile nations cannot prevent our own use of space; (3) negating, if necessary, hostile space systems; and (4) enhancing operations of U.S. and Allied forces. Consistent with treaty obligations, the national security space program shall support such functions as command and control, communications, navigation, environmental monitoring, warning, surveillance, and force application (including research and development programs which support these functions).

Inter-Sector Policies

- The U.S. government will maintain and coordinate separate national security and civil operational space systems where differing needs of the sectors indicates.

- Survivability and endurance of national security space systems, including all necessary system elements, will be pursued commensurate with the planned use in crisis and conflict, with the threat, with the availability of other assets to perform the mission.

- Government sectors shall encourage to the maximum extent feasible, the development and use of U.S. private sector space capabilities.

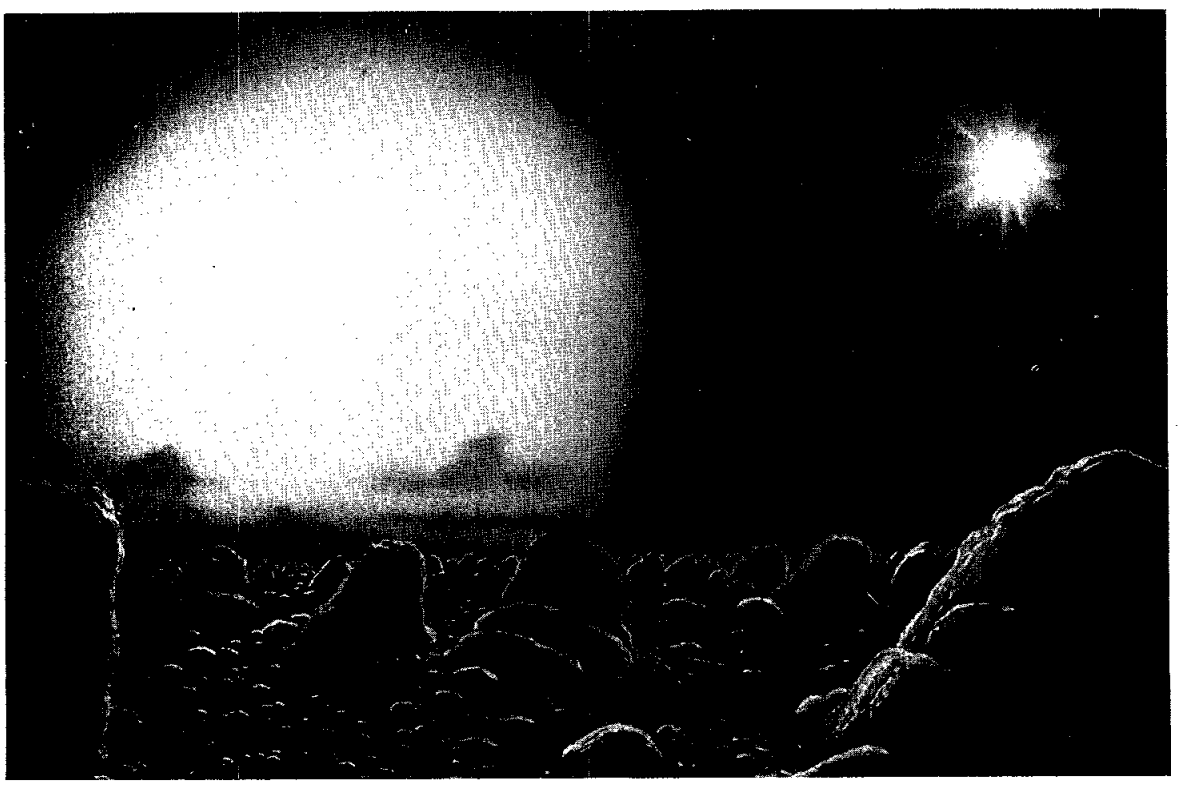
- A continuing capability to remotely sense the Earth from space is important to the achievement of U.S. space goals. To ensure that the necessary capability exists, the U.S. government will: (a) ensure the continuity of LANDSAT-type remote sensing data; (b) discuss remote sensing issues and activities with foreign governments operating or regulating the private operation of remote sensing systems; (c) continue government research and development for future advances in remote sensing technologies or systems: and (d) encourage the development of commercial systems, which image the Earth from space, competitive with, or superior to, foreign-operated civil or commercial systems.

- Assured access to space, sufficient to achieve all U.S. space goals, is a key element of national space policy. U.S. space transportation systems must provide a balanced, robust, and flexible capability with sufficient resiliency to allow continued operations, despite failures in any single system. The U.S. government will continue research and development on component technologies in support of future transportation systems. The goals of U.S. space transportation policy are: (1) to achieve and maintain safe and reliable access to, transportation in, and return from, space; (2) to exploit the unique attributes of manned and unmanned launch and recovery systems; (3) to encourage to the maximum extent feasible, the development and use of U.S. private sector space transportation capabilities; and (4) to reduce the costs of space transportation and related services.

- Communications advancements are critical to all U.S. space sectors. To ensure necessary capabilities exist, the U.S. government will continue research and development efforts for future advanced space communications technologies.

- The U.S. will consider and, as appropriate, formulate policy positions on arms control measures governing activities in space, and will conclude agreements on such measures only if they are equitable, effectively verifiable, and enhance the security of the U.S. and our allies.

- All space sectors will seek to minimize the creation of space debris. Design and operations of space tests, experiments and systems will strive to minimize or reduce accumulation of space debris consistent with mission requirements and cost effectiveness.



NASA Illustration

A Martian sunrise such as the one depicted in this artist's concept could greet humans when the President's long-range goal of expanding human presence beyond Earth orbit is realized.

Civil Space Sector Guidelines

- Introduction. In conjunction with other agencies: NASA will continue the lead role within the federal government for advancing space science, exploration, and appropriate applications through the conduct of activities for research, technology, development and related operations; National Oceanic and Atmospheric Administration will gather data, conduct research, and make predictions about the Earth's environment; Department of Transportation (DOT) will license and promote commercial launch operations which support civil sector operations.

- Space Science. NASA, in collaboration with other appropriate agencies, will conduct a balanced program to support scientific research, exploration and experimentation to expand understanding of: (1) astrophysical phenomena and the origin and evolution of the universe; (2) the Earth, its environment and its dynamic relationship with the Sun; (3) the origin and evolution of the solar system; (4) fundamental physical, chemical and biological processes; (5) the effects of the space environment on human beings; and (6) the factors governing the origin and spread of life in the universe.

NASA heads hydrogen fuel technology effort for aerospace plane

When the proposed National Aero-Space Plane (NASP) leaves the runway sometime in the 1990's, the fuel that powers it may be largely the result of technology efforts being coordinated today by NASA Lewis Research Center, Cleveland.

NASP is a joint NASA/Department of Defense program with the ultimate goal of developing an air-breathing experimental flight vehicle designated the X-30. The X-30 will take off horizontally, fly directly into orbit, then land like a conventional aircraft. It also may have the capability to cruise through the atmosphere at sustained hypersonic (above Mach 5) speeds.

Researchers are focusing on "slush" hydrogen, a high-energy hydrogen slurry, as the primary propellant for NASP. It is denser than liquid hydrogen and requires smaller tanks for the same amount of propulsive capability. The tanks themselves can be lighter in weight because slush hydrogen requires an internal pressurization of only 1 pound per square inch. Also, slush hydrogen is a better coolant for the vehicle and engines than liquid hydrogen.

Using slush instead of liquid hydrogen "reduces the size of the NASP and reduces the projected gross liftoff weight by up to 30 percent," according to Ned Hannum, Deputy Chief of the Space Propulsion Technology Division, Lewis Research Center.

The slush hydrogen technology development team, headed by Lewis Research Center, was formed about 3 years ago when very little was known about the material's properties. Each team member is assigned a specific area of research.

- The National Institute of Standards and Technology (NIST) is investigating instrumentation, the physical properties of slush hydrogen and production methods. NIST also has a historical data base and experience in slush hydrogen production and pumping.
- McDonnell Douglas and its subcontractors, Air Products, Martin Marietta and Wyle Laboratories, are performing large-scale experimental work in slush production, pressurization, transfer and flow modeling.
- The University of Michigan is working on the gelation of hydrogen and slush hydrogen. Gelated hydrogen probably will not be available for NASP, but may help control sloshing of hydrogen fuels in the propellant tanks of future flight vehicles.
- The University of Colorado is studying slush hydrogen thermal acoustic oscillation phenomena.
- The Los Alamos National Laboratory is investigating the safety aspects of slush hydrogen, including the levels of oxygen contamination that will be acceptable in slush hydrogen propellants.

As part of the in-house activity at Lewis, Air Products has constructed the slush maker at Lewis' Plum Brook Station near Sandusky, Ohio. The plant, slated to begin operation late this winter, will be capable of producing slush hydrogen in 800-gallon batches. The slush facility will allow researchers to explore production, transfer and storage of slush. Lewis' experimental efforts are a major portion of the overall slush hydrogen program.

AIAA awards triple honors to engineer Wesselski

(Continued from Page 1)

from the Advanced Systems Division introduced the concept of devising an escape system using a pole."

Just about the time our telescoping pole design began to take shape, Wesselski said, "problems began to develop with the other design, which was being developed concurrently." The pole turned out to be almost exclusively a JSC project, according to Wesselski, from the design concept to the fabrication of the test and flight articles in the Tech Services shop. "About the only thing done off site was the flight testing, which was done in the C-141 at Edwards AFB in California," he said.

The former Wharton Junior College and Texas A & M engineering graduate from Nada, Texas, who earned his masters at the University of Houston, actually got beyond the drafting table and out to the airstrip at Edwards to witness a few of those tests, once the design was complete. "I couldn't go up in the planes," he said. "But those Navy jumpers looked great from the ground."

Wesselski primarily remembers the teamwork required to complete "the best project I ever worked on."

"We were on a pretty tight schedule of milestones which we had to integrate with the Cape and with Rockwell," he said. "Our design and testing team consisted of about five 'sub-teams' of about 40-50 people., which included in-house division support and supprt from Lockheed Engineering.

"With the backing of Dick Colonna, manager of the Orbiter Projects Office, who from the first felt the pole was a very valuable concept, and with the support of the Engineering directorate, we were able to pull the people in that we needed to make it a success."

Wesselski plans to travel to Los Angeles in February, to accept the national award at the AIAA's Aerospace Engineers Conference and Exhibit. He is currently developing joints for the Space Station's truss structure, continuing the work he was engaged in when the escape pole project intervened.

JSC Photo by Jack Jacob

GOLDEN ANNIVERSARY— Center Director Aaron Cohen presented Andrew "Pat" Patnesky a unique plaque honoring him for 50 years of government service at the weekly senior staff meeting Monday. Patnesky joined JSC 28 years ago, after service as an aerial photographer with the U.S. Army Air Corp. The plaque illustrates the aircraft Patnesky served in, and spacecraft representing the NASA programs he has suppoirted during his career.

Drug-free program to begin

President Bush has directed federal agencies to fully implement their Drug-Free Workplace Programs by January 5, 1990. The NASA plan for a Drug-Free Workplace, developed under the direction of the Reagan administration, has been on hold since April, 1989. At that time several union locals filed a lawsuit seeking to prevent implementation.

NASA had decided to wait for the court's decision to determine how next to proceed, although the plan could be implemented while the suit was pending. Because the agency must now comply with the President's instructions, however, its program will go forward.

The NASA plan emphasizes drug education and confidential counseling and referral services through the Employee Assistance Program. The most controversial feature of the plan concerns random drug testing of employees in certain sensitive positions.

At JSC, there are currently 489 positions which meet the criteria for random drug testing. Employees who occupy these positions will be notified in writing that they will be subject to random drug testing once the program is implemented.

An information packet about the Drug-Free Workplace Program was distributed to JSC employees earlier this year. A schedule for a series of briefings about the program will be announced soon. Contact Bob Hall, x30613, for additional information.

Retirement legislation changes

Employees under the age of 65 who retire after December 31, 1989, will be required to pay for Federal Employees Group Life Insurance (FEGLI) coverage at the same rate as regular employees, until they reach age 65, due to changes in legislation.

Payments will be withheld from regular monthly retirement benefits. Current retirees, and those who retiree before December 31, can carry certain FEGLI coverage at no cost. For information, see page 14 of the Benefits Handbook, or call a retirement counselor at x32681.

JSC Exchange/EAA to aid Marshall relief fund

To support tornado victims

JSC's Employee Activities Association (EAA) is accepting donations to support relief efforts for the Marshall Space Flight Center employees and their families who were affected in the November 15 tornado strike. The tornado that hit Huntsville, Alabama killed three Marshall workers, injured many more, and caused extensive property damage.

The JSC Exchange/EAA is providing employees an opportunity to support the Marshall relief efforts. Monetary contributions may either be submitted to your division office, or mailed directly to the NASA Exchange-JSC Business Office, Mail Code AW, in Bldg. 11, room 127B. All contributions are completely voluntary. Checks may be made payable to the NASA Exchange-JSC.

The process set up by Marshall specifies that their employees, including on-site contractor personnel, will be eligible for these emergency funds. Requests for assistance from affected Marshall employees will be reviewed by a special employee committee set up by the EAA, and funds will be disbursed as appropriate. Any excess contributions will be donated to Huntsville area relief organizations.

For additional information, contact Glenda Lancon, x30282, Heidi Glaisyer, x30452, or Teresa Sullivan, x38970.

Return 'almost flawless'; *Discovery* flight a success

(Continued from Page 1)

JSC Director Aaron Cohen, who has just returned from NASA Headquarters to resume running the center full time, welcomed the crew back to a belated Thanksgiving. "The weather is wet and cold, but the welcome is warm," he said.

"Our first Thanksgiving was early and that's when the main engines cut off and we were where we were supposed to be," Thornton said. "It was the most memorable Thanksgiving of my life, being up there on orbit."

Thorson named to space station systems integration

(Continued from Page 1)

Mission Operations Directorate (MOD), previously has been manager of the Space Station Program Office's Operations Office, technical editor and production manager for the Phase B space station request for proposals; chief of the Vehicle Systems Integration Office in MOD, and chief of the Flight Techniques and Avionics Software Integration Office in the Flight Operations Directorate.

Goree has been JSC Space Station Projects Office manager since 1987. Before that, he had served as deputy manager for NSTS system integration, and deputy manager for NSTS technical integration. He came to JSC in 1962 to work for the Apollo Spacecraft Program Office.

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.

Swap Shop deadline is every Friday, two weeks before the desired date of publication.

Editor ..... Kelly Humphries

Associate Editor .... Linda Copley

JSC Child Care Center Toy Fair to be held

The JSC Child Care Center will hold a Toy Fair at Gilruth Rec Center on December 3 from 1-4:30 p.m.

Space Family Education, Inc. has invited selected vendors and manufacturers of quality children's toys to set up booths at the Toy Fair. Dr. Diane Kane, who has been a professional consultant for the JSC Child Care Center, will also talk during the afternoon about the things to look for in quality toys. These types of toys are fun, safe, and stimulate educational or developmental skills in children. Approximately 10 exihibitors will be present.

For every purchase made at the fair a percentage of the price will go towards the purchase of items for the JSC Child Care Center.

Cohen home as JSC Center Director again

Aaron Cohen, temporarily assigned to NASA Headquarters for the purpose of planning the agencies Lunar and Mars Initiatives program has returned to JSC.

The assignment has been completed for the most part, and the few tasks which remain will be accomplished through short term absences from the center.

Cohen again assumes the position of Center Director. P.J. Weitz, who has been serving as Acting Director in Cohen's absence, once again assumes the responsibilities of Deputy Director.

December LDEF sighting opportunities

Morning sighting opportunities for the LDEF (Long Duration Exposure Facility) satellite are listed below. This sighting data are for the Houston metropolitan area. This data should be accurate to plus or minus two minutes.

LDEF sighting data will continue to be provided until it is retrieved on the STS-32 mission.

On December 3 at 5:49 a.m. LDEF may be seen for approximately one minute at a maximum elevation of 58 degrees, appearing 38 degrees above west southwest moving to 58 degrees above the south. On December 4 at 6:15 a.m. LDEF may be seen for 2 minutes at a maximum elevation of 35 degrees, appearing 15 degrees above west southwest moving to 35 degrees above south southwest. (**Note**: an elevation angle of 0 degrees corresponds to the horizon, while an elevation angle of 90 degrees is directly overhead.

A clear cloudless night is a must for observation, preferably in rural area away from city lights.

Question regarding LDEF sightings should be directed to Steve Stich, x38038.