

### Side kicker

A new deployment system being developed at JSC will kick heavy, unwieldy payloads over the side. Story on Page 4.



### On deck

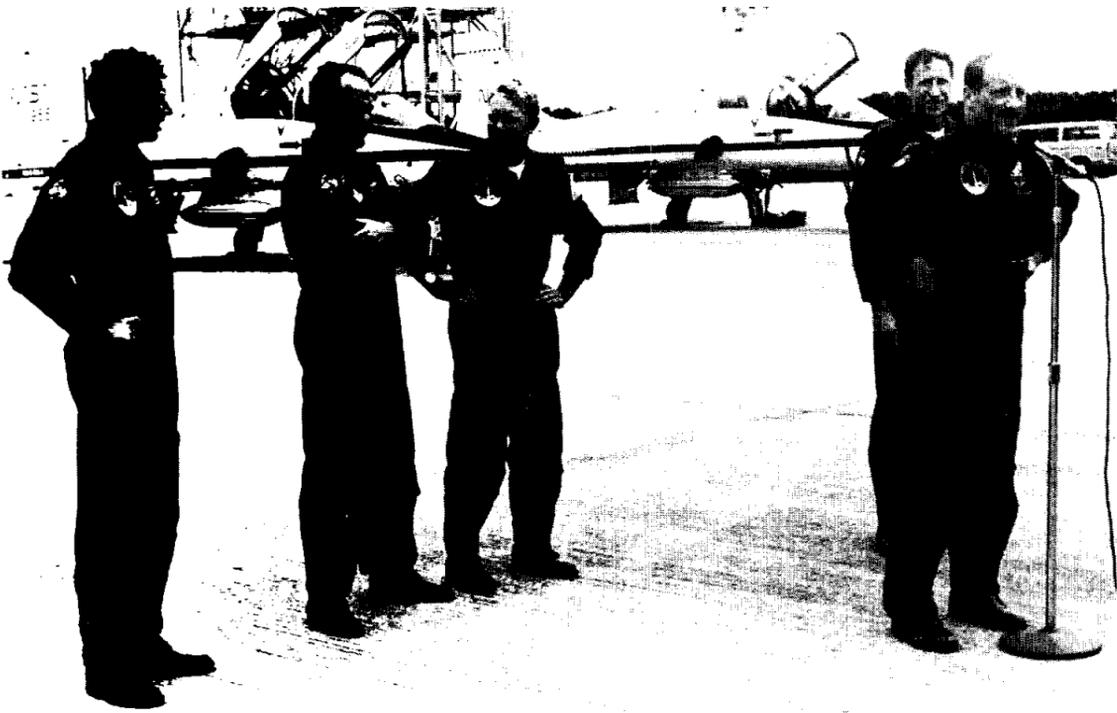
The crew of STS-27 is next up at bat with a scheduled launch date in November. Photo on Page 4.

# Space News Roundup

Vol. 27

September 16, 1988

No. 29



STS-26 crew members arrive at Kennedy Space Center's Shuttle Landing Facility for last week's Terminal Countdown Demonstration Test (TCDT). The astronauts and launch crews went through the launch dress rehearsal with flying colors. From left are Mission Specialists Dave Hilmers, Mike Lounge and Pinky Nelson, Pilot Dick Covey and Commander Rick Hauck.

## Discovery's launch just days away

By James Hartsfield

The countdown for *Discovery's* launch and Americans' return to space on Sept. 29 is scheduled to begin at the T-minus 43 hours mark at 11:01 p.m. CDT Sunday.

The three-hour launch window will begin at 8:59 a.m. CDT Sept. 29, a date announced Friday. The count features several built-in holds and T-minus zero is

On Wednesday, NASA Deputy Administrator Dale Myers said the review had been an excellent working meeting. "I think it's been a really important milestone in the program with tremendous, open discussion about the problems we're involved in," Myers said.

The review was a "total success," Truly added.

"The major review to clear

scheduled to be about 81 hours after the count begins on Sunday.

When *Discovery* goes aloft on the 26th Space Shuttle mission, it will be the result of years of hard work by the NASA team, Richard Truly, associate administrator for space flight, said. "NASA's decision to set this launch date is based on over two years of persistence and dedication by NASA and contractor personnel," Truly said. "I'm delighted and my hat is off to all members of the Shuttle team whose tireless efforts have brought us here to the brink of America's return to manned spaceflight."

Rick Hauck, commander of the STS-26 crew, summed up the crew's feelings about the work of JSC employees toward the return to flight on Thursday.

"As we get closer, almost daily, almost every minute, it emphasizes how much hard effort has gone into getting back to flight status," Hauck said. "I think almost everyone here has contributed. It gives you a warm feeling to be a visible part of such an effort that everyone has done so superbly."

The crew will leave Houston on Monday for Kennedy to begin their voyage.

The decision on a launch date was to be made following the flight readiness review, a meeting of top management, at Kennedy Space Center on Wednesday. But uncertainty about the intentions of Hurricane Gilbert caused the decision to be delayed until Friday.

STS-26 for flight was just held. We're now going to turn over the results of the review, and there are plenty of action items and work to be done between now and flight, to the operations team here at Kennedy and to the Mission Management Team."

The meeting was extremely thorough, Truly said. "In the last two days we went through every system, all the preparations for the teams training in Houston, at the Cape, around the world, to make sure that everybody's ready for this flight. And, as far as I'm concerned, they are."

During the weekend, technicians at Kennedy conducted the helium signature leak test of *Discovery's* main propulsion system. The test is designed to identify any leaks in the system or main engines and was expected to pinpoint the source of a tiny liquid hydrogen leak detected during routine post-flight readiness firing inspections.

The leak is thought to be in a valve and to occur only during fueling of liquid hydrogen. It is not expected to have any effect on the Sept. 29 launch date. Preliminary analysis shows the leak to be within flight specifications.

All work at Kennedy's Launch Pad 39B is now in support of *Discovery's* launch next week. The poppets for the Gaseous Oxygen Flow Control (GOX) valves in *Discovery's* three main engines were reinstalled last week. The poppets had been removed and found to be contaminated. Please see **LAUNCH**, Page 4



## STS-26

The Return to Flight

## New launch viewer limits set

### Safety guidelines allow fewer media, guests

The number of people allowed on-site at Kennedy Space Center during the launch of STS-26 will be greatly reduced from previous missions due to revised range safety guidelines.

The limited access to KSC during launch will affect employees as well as media representatives and invited guests, Col. Larry Gooch, Air Force Commander of the Eastern Space and Missile Center, said Tuesday. The Air Force is in charge of range safety during Shuttle launches, the prime consideration for limiting access to the center.

"The Challenger tragedy and the subsequent Titan 34D accident at Vandenberg Air Force Base provided new empirical data about the dangers large solid rocket boosters impose," Gooch said. "Based on this data, the Air Force and NASA have implemented new flight rules for STS-26. The number of viewers at the site closest to the launch pad has been reduced, other viewers have been moved to safer sites farther away, and the total number of persons on the center has been reduced."

About 16,000 employees and

media will be allowed on-site at the Vertical Assembly Building, the Launch Complex 39 Press Site, on Contractor Road, at KSC Headquarters and at the KSC Visitor Center. About 15,000 dependents, guests and media will view the launch from a new site at the Static Test Road and KSC Causeway, about six and a half miles from Pad 39B. In the event of any problems with the launch, the safety factor at the more distant viewing site is about 100 times greater than closer areas, Gooch said.

The goal of the new rules is to enhance flight safety and the safety of those viewing the launch, explained Jay Greene, chief of the JSC Safety Division. "The Shuttle vehicle is better than it was before to the best of anybody's ability to make it so. The thing that's changed is not a worsening of the risk, it's a better understanding of the risk," Greene said. "It always comes down to a challenge to optimize both ground safety and flight safety. You have to move the range safety limit lines as far back as possible and let the vehicle maneuver wherever

it can — and then you manage the risks of the people on the ground."

Criteria from the Challenger accident showed that solid rocket motors (SRMs) separated while still ignited are capable of achieving stable, sustained flight, contrary to previous opinion. Also, when range safety explosive devices were detonated, the SRMs fragmented in a far wider fashion than had been predicted, Greene said. The Titan 34D failure that followed also provided new information on how burning propellant acted, leading to a conclusion that such propellant can affect a wider area.

"NASA has essential folks who've got to be inside (the final range safety limit line). And there are parts of the press that have essential, real-time reporting responsibilities that are only available at the press site," Greene said. "You balance the risk. You take your essentials and you minimize them."

The new limits on launch viewing may not be permanent, and could be relaxed if new methods of tracking and dealing with the SRMs are developed.

## President plans visit to address workers

President Ronald Reagan plans to visit JSC Thursday afternoon to speak to civil service and contractor employees in front of Bldg. 9A.

The President is expected to offer words of encouragement and support as NASA prepares to resume Shuttle flights, and may discuss the space station program. JSC Director Aaron Cohen and other NASA officials will attend.

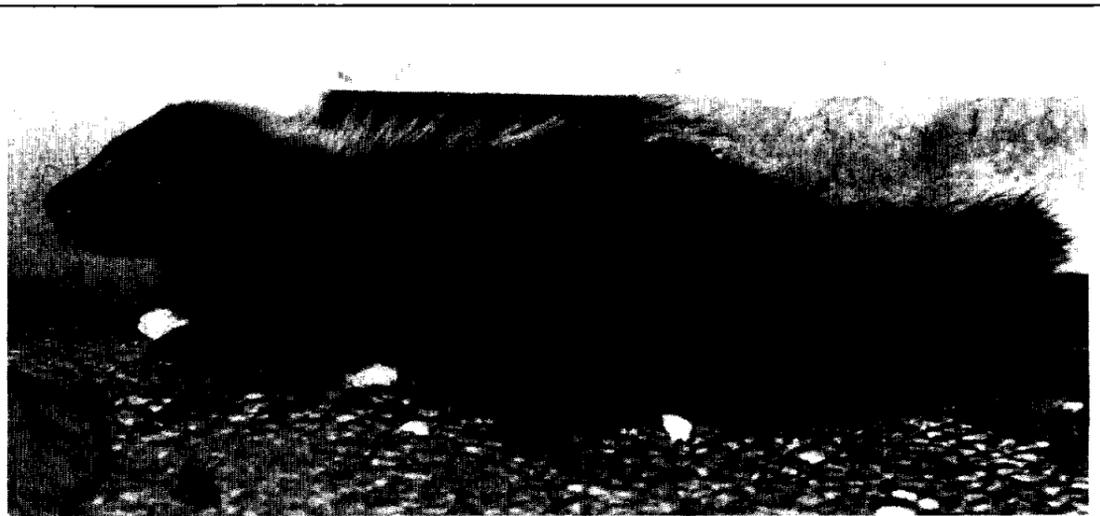
Reagan, who is to speak for about 25 minutes, may meet with the STS-26 crew in 9A before addressing other employees. The crew also is expected to be present for the speech.

The visit is part of a full day of activities in Texas including two appearances in Waco earlier in the day and another later Thursday elsewhere in Houston.

Employees who wish to see and hear the President will be assembled in the Bldg. 9A parking lot well in advance of his arrival. They will be expected to pass through a metal detector before being positioned.

The exact time employees will need to assemble at Bldg. 9A will not be known until later this week. Reagan's speech is expected to begin shortly after 3 p.m., but employees should check the recorded announcement on the JSC Employee Information Service, x36765, for the exact time they will need to arrive at 9A prior to the speech.

The news media will be covering the event, and will be positioned on a three-tier platform near the employee area.



JSC Photo by Kim Murray

**TAKING COVER**—Perhaps this small furry visitor had early warning last week of the stinky weather brewing in the Atlantic. The skunk was seen roaming around Bldgs. 8 and 10 before Hurricane Gilbert was even being discussed by humans. None of the humans who witnessed the small mammal's wanderings bothered it, and it in turn left the humans alone. Gilbert also left JSC alone.

# JSC People

## Kranz to receive Gilruth Trophy

Eugene Kranz, director of JSC Mission Operations, has been selected as recipient of the Gilruth Trophy. The North Galveston Chamber of Commerce will present the trophy to the "North Galveston County Citizen Most Responsible for the Safe Return to Space Flight."



Kranz

Congressman Jack Brooks is scheduled to present the award during the "Return to Space Flight Banquet," sponsored by the chamber on Oct. 13 at the new South Shore Harbor Resort and Conference Center.

## Draper takes over comptroller duties

Wayne L. Draper has been appointed acting comptroller following the retirement of Larry G. Damewood. Draper, who has been deputy comptroller since 1987, came to JSC in 1963. He has been special assistant to the Director of Administration, manager of the Space Operations Business Management Office and manager of the STS Operations Program Control Office.

Damewood also came to JSC in 1963, as a contracting officer for the Gemini and Apollo programs. He had been chief of the Research and Development Budget Office, chief of the Space Shuttle Resources Office, chief of the Central Budget Office and director of finance for the Administration Directorate.

JSC

## Today

**EAA Badges**—Dependents/spouses may apply for a pictured I.D. badge from 6:30-10 p.m., Monday through Friday.

**Aerobics and exercise**—Both classes are on-going. Sign up at the Gilruth Recreation Center.

**Cafeteria menu**—Entrees: seafood gumbo, broiled codfish, fried shrimp, baked ham, tuna and noodles casserole (special). Vegetables: corn, turnip greens, stewed tomatoes.

## Saturday

**Spaceweek organizational meeting**—The Apollo 11 20th anniversary kickoff meeting for Spaceweek is getting ready to mark the milestone next summer. The Spaceweek National Headquarters organizational meeting will be from 10:30 a.m.-2 p.m. in the Rec Center, Rm. 217. Volunteers are welcome. For more information, call the Spaceweek office at 480-0007.

**Saturday evening stargazing**—JSC Astronomical Society and Challenger Memorial Park offer you the opportunity to view the moon and planets through telescopes provided by local amateur astronomers. Challenger Memorial Park is located at 2301 W. NASA Boulevard. For more information, call Bill Williams, x33848 or 339-1367.

**Defensive driving**—Course is 8 a.m.-5 p.m. Sept. 17 or Oct. 22. Cost is \$20.

## Monday

**Navy League Council meeting**—The United States Navy League (USNL) Council will meet with a cocktail reception at 6:30 p.m. followed by dinner at 7 p.m. at the South Shore Harbor Country Club. Donald E. Smith, vice president and general manager for Bendix Field Engineering Corp., is the new president and will speak at 7:45 p.m. Tickets are \$15 and reservations must be made by 5 p.m. Sept. 19. For information, call Mary Todd,

282-3900.

**Cafeteria menu**—Entrees: Chicken Noodle soup, wieners and beans, round steak w/hash browns, meatballs and spaghetti (special). Vegetables: okra and tomatoes, carrots, whipped potatoes.

## Tuesday

**Cafeteria menu**—Entrees: beef and barley soup, beef stew, shrimp creole, fried chicken (special), sweet and sour pork chop w/fried rice. Vegetables: stewed tomatoes, mixed vegetables, broccoli.

## Wednesday

**Spaceland Toastmasters meet**—The Spaceland Toastmasters will meet at 7:15 a.m. in the Bldg. 3 cafeteria. For more information, call Maurice Brooks, x30313, or Carl Martin, x31559.

**Cafeteria menu**—Entrees: seafood gumbo, fried perch, New England dinner, Swiss steak, (special); Vegetables: Italian green beans, cabbage, carrots.

## Thursday

**IEEE Education Committee conference**—A videoconference sponsored by the IEEE Education Committee will focus on "Photonic Switching in Communications and Computing" and is scheduled from 10:30 a.m. to 2 p.m. For more information, call Eddie Robinson, 333-7029.

**Amiga users meet**—The next meeting of area Amiga enthusiasts will be at 7 p.m. Sept. 22 at 600 Gemini. New members are encouraged to bring their questions and watch demonstrations of new hardware and software. For more information call Hal Getzalan, x31897.

**Mixed soccer sign up**—Registration for the Saturday mixed soccer league will be held at 7 a.m. at the Rec Center for badged teams and 5:30 p.m. for unbadged teams. League play will begin Oct. 1. For more information,

call, x30303.

**Weight Safety**—The next weight safety course required for employees wishing to use the Rec Center weight room will be from 8-9:30 p.m. Cost is \$4.00.

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

## Sept. 23

**Nature symposium and plant sale**—Armand Bayou Nature Center will host its fourth annual symposium from 9 a.m.-5 p.m. Sept. 23-25. The event promotes landscaping that maximizes benefits for both homeowners and the community. A plant sale to raise money for the non-profit nature center also will be held.

## Sept. 24

**Lovin' Feelings VII concert**—The seventh annual premier rock 'n roll oldies show will be at 7:30 p.m. Sept. 24 at the Summit. Featured artists are Johnny Rivers, the Kingsmen, the Drifters, the Platters, the Guess Who, the Grass Roots and Tommy James and the Shondells. Tickets are \$15 at the Bldg. 11 Exchange Store. For more information, call x35350.

## Sept. 25

**NHL Hockey Challenge '88**—The Detroit Red Wings will meet the St. Louis Blues at 7 p.m. Sept. 25 at the Summit. Tickets are \$21 in the Bldg. 11 Exchange Store. For more information, call x35350.

**Challenger Park fundraiser**—A fundraiser for the Challenger 7 Memorial Park will be held Sept. 25, Oct. 2 in case of rain. Events will include a volleyball extravaganza, a celebrity softball tournament, a chili cook-off and a raffle.

**Bay Area PC Organization meeting**—The next BAPCO meeting is scheduled at 7:30 p.m. at the League

City Bank & Trust on Sept. 27. For more information call Earl Rubenstein, x34807.

## Sept. 27

**BAPCO meets**—The Bay Area PC Organization (BAPCO) will meet at 7:30 p.m. Sept. 27 at the League City Bank & Trust. For more information, call Earl Rubenstein, x34807, or Ron Waldbillig, 337-5074.

## Sept. 29

**Fall Classic softball tourney**—The last men's softball tournament of 1988 will be a two-day Men's Open C Tournament limited to the first 24 paid teams. Entry deadline is 5:30 p.m. Sept. 29. Cost is \$95. Sign up at the Rec Center.

**NACA reunion**—The National Advisory Committee for Aeronautics (NACA) will hold its fourth national reunion Sept. 29-Oct. 2 in San Jose, Calif. NACA Reunion IV is for former employees, spouses and military detailees and will be held at the Red Lion Inn in San Jose. Super meeting saver air fare discounts are available with a savings of up to 40 percent from American Airlines in cooperation with Abel Love, Inc. For airfare information, call the JSC Travel Office at x38688. For other information, call x33067.

**Return to flight celebration**—The eighth annual North Galveston County Chamber of Commerce's Bayou Festival will adopt "A Return to Space Flight Celebration" as its theme Oct. 15-16 at Walter Hall Park in League City. A return-to-flight banquet has been slated Oct. 13 at the South Shore Harbour Resort and Conference Center. As part of the festivities, a special award will be presented to the "North Galveston County Citizen Most Responsible for the Safe Return to U.S. Space Flight."

# Swap Shop

## Property

Sale: League City, 3-2-2, cul-de-sac, landscaped, low equity, FHA 10% fixed assum. David, x35464.

Sale/Rent: Lake Livingston townhouse, 2-2-2CP, 24 hr. sec., clubhouse, pool, tennis & volleyball courts, playground, boat ramp, on the water. 554-5514.

Lease: 3-1-1, large yard, fenced, window A/C, C/H, ceiling fans, range, 626 Arvana, Pasadena schools, very clean, \$400/mo., plus \$200 dep. 487-2978.

Sale: Middlebrook, 3-2-2, study, FPL, wet bar, covered patio, large lot, ex. cond., FHA assum. 10%. 480-9363.

Rent: Lake Livingston, waterfront, 3-2, fully furnished, covered decks, pier, ex. fishing, swimming, skiing, new cond. 482-1582.

Sale: CLC Brook Forest, 4-2.5-2, approx. 2,500 sq. ft., both formals, large MBR, double FPL, landscaped, near schools, \$134,500. x37016 or 488-7224.

Lease: Baywind I condo, 1-1, upstairs, refrig., stove, dishwasher, \$260/mo. plus dep. Bill Gordon, x35023 or 280-8671.

Sale: Angleton, Bar-X-Ranch, 1-1/3 acre, corner lot, near 2 pools, 2 lakes, picnic area, sm. equity, take over payments. 470-1374.

Rent: West Galveston beach house, 2-2, beach 100 yards, boat landing, marina w/pool, \$500/week, weekend rates avail. Fendell, x31206 or 538-1147.

Rent: Clear Lake near Ellington, 2 BR apartment, \$350/mo. Eric, x38420 or Herb, x38161.

Sale: League City, 3-2, 14' x 80', 1985 mobile home & 50' x 150' lot, trees, near schools, \$27,000. 334-3037.

Lease: Seabrook, Repsodorph Rd. at Pebble Brook, 1-1 condo, FPL, W/D, balcony, pool & tennis courts, co-op terms avail, \$295, mo. 681-4732.

Sale: Madisonville, TX, 18,763 unimproved acres, timber, mostly hardwoods, good road, electricity, telephone, water avail., ex. squirrel, deer hunting, \$950 per acre. Roland, 480-3377 or 538-1697.

Sale: 3-2 lakehouse, 2.5 mi. from Livingston, A/C, furnished, 2 acres, wooded, private lake. 472-3103.

Sale: Friendswood, 4-2-2, Clear Creek ISD, new paint, trees, fenced, large yard, miniblinds, new carpet, \$42,900. Carolyn, 280-0021.

Rent: Galveston, Victorian Gulf-front condo, fully furnished, sleeps 6, 2 pools, 3 whirlpools, 2 tennis courts. 480-5270.

## Cars & Trucks

'59 Mercedes Benz 220S, \$3,000. David, x35464.

'66 Ford transmission, \$200. Jim, x38321 or 334-4631.

'79 Chevrolet Chevette, 4-spd., 53K mi., A/C, new tires, brakes, clutch, recent tune-up. Michael, 282-5443 or 863-8710.

'74 Jeep J-10 pickup, 4x4, A/C, w/topper, \$2,700, OBO. Jeff, 554-4272.

'84 Ford Bronco XLT, 4 spd., A/C, cruise, tilt wheel, P/S, P/B, 300 C.I. 16, runs great. 69K mi., \$7,150. x33586 or 485-0237.

'82 Mercury Capri, 6 cyl., auto., P/S, P/B, A/C, AM/FM cass., cloth int., 51K mi., ex. cond., \$2,800. Bob, x39079 or 488-5881.

'80 Mazda GLC sport 3 door hatchback, 5 spd., A/C, AM/FM cass., 93K mi., \$1,100. 333-3071.

'77 AMC Matador, 56K mi., good running cond., body needs work. Kevin or Blanche, 996-7736.

'83 Porsche 944, silver, 5 spd. trans., sun roof, 43K mi., alarm system, two new tires, ex. cond., \$14,500. Frank, x36221 or 333-5251.

'78 Camaro LT, 350 V-8, auto., highrise alum. intake w/650 CFM Holley 4 bbl., blaketrack exhaust headers, P/S, P/B, A/C, AM/FM stereo w/cass., needs paint, some interior work, \$1,000. Noakes, x39668 or 482-3546.

'83 Chevy custom van, pwr., cruise, dual A/C, AM/FM, cass., sunroof, Starcraft conversion, 78K, ex. cond. Ramon, 282-5335 or 332-3047.

'65 Ford Mustang, some body & int. work needed, minor mech. repairs, engine has been rebuilt, ideal auto for "classic collector"; rebuilt 289 eng., \$1,200 for both, OBO. Trudy, 283-7327.

'74 VW Thing and numerous spare parts, \$2,200. x31226 or 534-3710.

'76 Datsun 280Z, mech. good, auto., A/C, AM/FM, runs good, some rust. Ed, x30798 or 474-5074.

'75 Olds Cutlass Supreme, 2 dr., V-8 350, A/C, P/S, P/B, AM/FM cass., trailer hitch, orig. paint, \$925. Mike, x34383.

'86 GMC Safari van SLE, 2-tone, 38K mi., fully loaded. Bob, 335-6066 or 486-1766.

## Cycles

Honda XL 100, street legal, needs tune up & seat, \$70. Pat, x33858.

BMW R65, 17K mi., BMW bags, blue, garaged, ex. cond., \$2,495. Chris, x31586 or 554-6307.

'77 750 Honda, fairing, crash bars, \$600. Tim, 996-9191.

'72 Honda 450cc, needs brakes, clutch and throttle cables, \$225. x34270 or 337-1896.

'81 650 full dress Honda, custom, many extras, \$1,200, OBO. 473-5021.

'83 Honda 650 Nighthawk, always garaged, 3,600 mi., ex. cond., w/helmet, \$1,300. David, 282-1987 or 480-4692.

'83 CB 1100 F Honda, red & white, ex. cond., new tires, new sprockets & new chain, \$2,100, OBO. 980-9750.

## Boats & Planes

'88 9' Coleman bass boat w/3hp Sears motor, 14' trailer, \$950. Joe, x33190 or 482-3069.

'85 used Mistral Malibu windsurfer, \$650. Bullock, 488-6526.

'81 16' Newman Cam II runabout, 100hp outboard w/trailer, ex. cond., \$3,800, OBO. 480-9363.

'62 Beechcraft Bonanza, Model P35, 3100TT, 450 SMOH, IFR equipped, 3-blade prop, sloped single piece windshield, 80 gal. fuel, Cleveland wheels and brakes, Smith and Beech tail mod, \$29,500. Ken Cockrell, x39877 or 486-4763.

18' Hobbie Cat galv. trailer, complete and ready to sail, \$2,275. x31226 or 534-3710.

'85 20' Rinker deckboat, 305 V-8 SSP, w/trailer & cover, \$7,950. Bob, 335-6066 or 486-1766.

Beginner's windsurfer, \$200. Tim, 996-9191. Meeks surfboard, 6'1" tri-fin, ex. cond., \$195. David, 488-3996.

Laser sailboat, \$300, OBO. Eric, x38420 or 484-9179.

15' center console w/25hp Evinrude, galv. trailer, trolling motor, assorted access., less than 100 hrs on new motor, good cond., \$1,800. Donald Thompson, x39475 or 644-5044.

## Audiovisual & Computers

Commodore Networking software, Quantum Link w/Casino & free month, \$10; Quantum Link, Casino, \$5, Total Telecommunications for Electronic University, \$5; Videx w/data pack, manuals, guides, etc., \$10. Samouce, x35094 or 482-0702.

Altec custom voice of the theater sound reinforcement speaker system, \$1,000. 480-9363.

Texas Instruments TI-99/4A computer system, was, \$1,500, now, \$800, OBO. 980-9750.

## Household

Bunk beds w/integrated dresser & linen, \$50; solid wood 6-dwr. dresser, detach. mirror cracked, \$20. 488-5304.

Queen size waterbed, full motion, \$30. Tim, 996-9191.

Automatic dishwasher, \$125. Jim, x38321 or 334-4631.

Sears portable dishwasher, \$50, OBO. Steve, x35521 or 334-1202.

Kenmore heavy duty two cycle washing machine, \$30. 332-2229.

French Provincial chair, lt. blue/grey, \$45. Ray, x33954.

Kenmore elec. sewing machine, zig-zag in cabinet w/matching chair, \$110; 2 large oriental brass lamps, \$75 ea.; brass oriental noodle server, \$200; child's table and Windsor chairs, \$60; antique school desk, \$65. 488-5564.

Couch & loveseat, 3 yrs. old, ex. cond., \$500; 12" Emerson black & white T.V., \$20. 484-5470.

Twin size trundle bed, maple, good cond., \$125. 488-5903.

Queen size sofa bed, \$150; large oak desk & chair, \$200; antique piano, \$200; antique mahogany buffet, \$100. 474-7432.

New beige Westclair lamp, hand painted w/ brown colors, top and bottom light up together or individually, \$85, OBO. 486-7465.

Antique oak, s-curve, roll top desk, \$950; cherry corner cupboard, 200 yrs. old, \$550; work table w/2 side drawers, \$175. Emily, 481-8847.

Bedroom set, inlaid and hand-carved oak,

includes full slat bed, large wardrobe, dresser w/mirror; & marble top wash stand w/tile inlay, \$2,199, OBO. 486-7465.

5" GE portable T.V., w/stereo AM/FM remove. cass., \$190. C.W., 282-1871 or 280-8796.

White-Westinghouse microwave, 9 mo. old, ex. cond., \$150; Emerson 1.6 compact refrig., 9 mo. old, ex. cond., \$150; T.V. cabinet, solid oak & glass, ex. cond., \$100; desk, 30x60, metal w/wood top, good cond., \$50. 474-5532 or 326-2794.

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# HEAVY-DUTY LIGHTWEIGHT

## New payload deployment system rolls cargo away from spacecraft

By Beverly Green

The developers of a new deployment system say rolling payloads over the Orbiter's side rather than ejecting them upward may lead the way for the Shuttle to carry larger, heavier payloads aloft in the future.

Subsystem manager Guy King says other NASA payload deployment systems may soon tip their hats to the unique capabilities of the compact and lightweight Stabilized Payload Deployment System (SPDS).

SPDS, pronounced "spids," doesn't whip payloads out like a Frisbee or perform complex maneuvers, but it will be able to do some of the jobs that the 1,300-pound Remote Manipulator System (RMS). Instead, it uses two motorized hinge-like devices attached to the side of the payload bay to lift the cargo out and to one side of the bay.

Then, pyrotechnics are used to release three pins that attach the payload to SPDS, and a small spring-loaded actuator gently pushes the payload away from the Orbiter.

The RMS can perform more complex maneuvers, but SPDS's ability to release heavier payloads may introduce a new-generation system that will become an alternate to the Shuttle's arm.

SPDS weighs in at 180 pounds and

takes up only two feet at each end of the 63-foot-long payload bay. Because it is stiffer than the RMS, minor movement of the Orbiter won't cause large changes in a massive payload's position. SPDS should be able to put into space a payload that weighs as much as 65,000 pounds.

Longer single payloads may be another advantage of the SPDS

contractors worked with NASA engineers to evaluate and refine the system based on the preliminary work done by the contractors. "This blue-ribbon team comprised of engineers, flight controllers and astronauts met religiously," said Bill Schneider, chief of the Mechanical Design and Analysis Branch. "First designs, especially in

of the blue-ribbon team that developed the design and test plan. He helped identify about 60 needed changes during the preliminary design review.

JSC engineer Tom Graves had discussed using a three-pin toggle release mechanism and sketched a swivel toggle with three pins and the design won hands down. "But the toggle was bald on one end and Guy King decided to put another swivel on the other end," said Schneider. "Presently, we have a patent pending," he added.

"Therefore the system is not only lightweight, it's two-fault tolerant. Each pin is redundant therefore if only one pin functions, the entire system will work," he explained.

SPDS's controlled release capability distinguishes the system from other payload deployment systems. SPDS has been designed to roll a payload out of the bay and then release the payload, for a more controlled means of deployment.

"This system can be visualized by looking at a door opening or closing. As one swings open a door the hinges will allow the slab of wood to move in

**"This system can be visualized by looking at a door opening or closing. As one swings open a door the hinges will allow the slab of wood to move in a controlled manner."**

— Bill Schneider

design because payloads will be released through rotation rather than ejection. The lightweight design is expected to be useful in a variety of payload deployment situations, including space station construction.

Rockwell has the job of fabricating the system, but initially two companies competed for the opportunity. Both

the release mechanism, were simply inadequate. A group of JSC engineers was asked to go to Rockwell, take off their badges, sit down and work with Rockwell engineers to come up with a system that would work reliably," Schneider said.

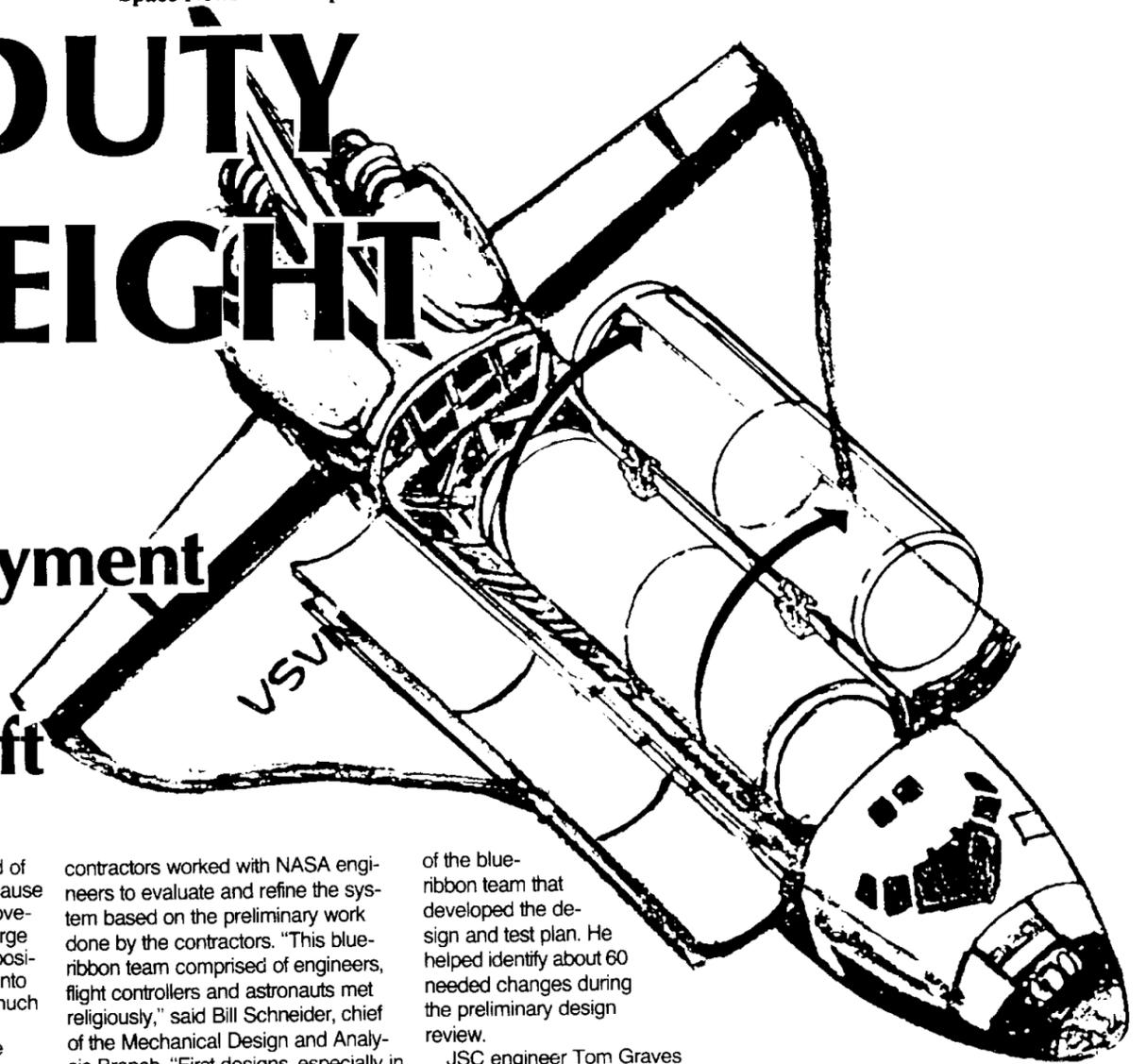
Dr. Kornel Nagy, head of Structural Design Section, was one of the leaders

a controlled manner," explained Schneider. The toggle may be thought of as motorized hinges, he said.

"Tight fitting payloads or heavy ones will be SPDS's main benefits," said David Grissom, office manager for Payload Integration Engineering office in NSTS Operations Integration Office. "SPDS was never intended to replace RMS, but only to provide unique applications," he said.

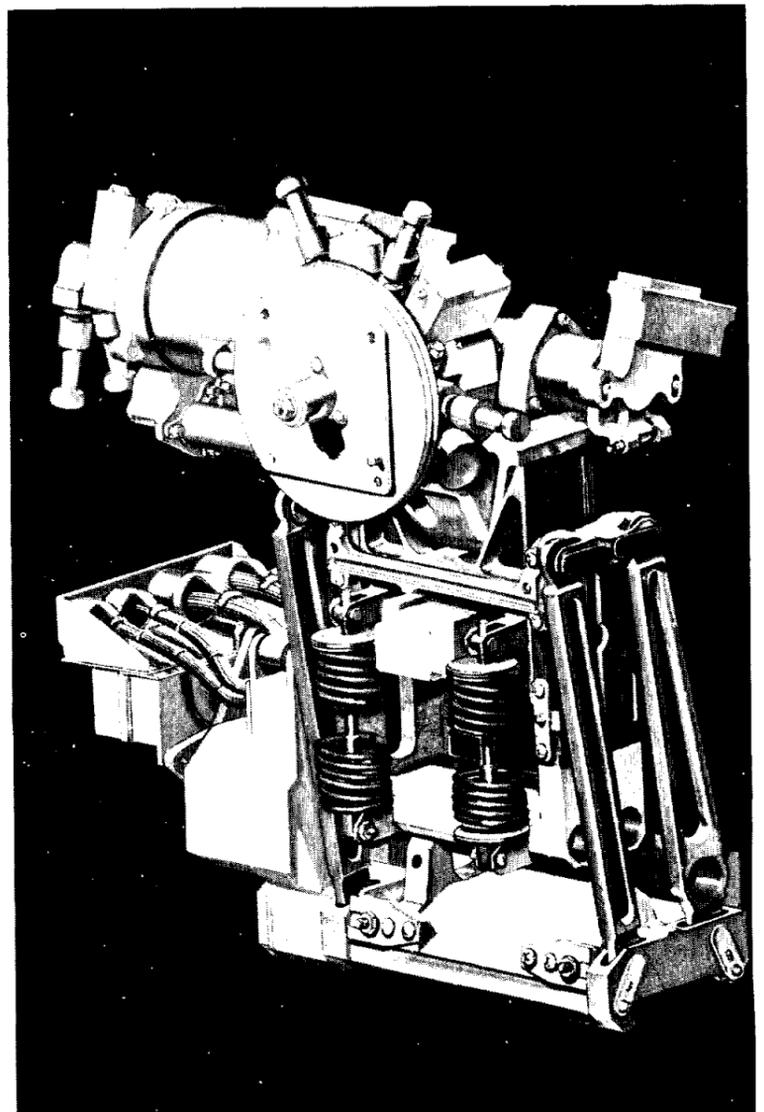
A Critical Design Review in February delighted Rockwell engineers, JSC contract coordinators and managers. "The project's been hard work for a lot of people and a really intense endeavor to meet design requirements," said King, SPDS subsystem manager. "We're presently in the early stage of the fabrication and testing of SPDS," said King.

A series of tests is planned throughout the year with a systems qualification test scheduled for completion by October 1989.



JSC Photo by Benny Benavides

Top: An artist's sketch shows how the Stabilized Payload Deployment System (SPDS) would roll a satellite out of a Space Shuttle's payload bay. Notice how little space is taken up by the two hinge-like devices. Above: The JSC team that developed SPDS inspects a half-sized model of the new payload deployment mechanism. Clockwise from left are Bill Schneider, Dr. Kornel Nagy, David Grissom, Tom Graves and Guy King. Right: An illustration shows the compact package of the 180-pound SPDS mechanism.



# Scientists work to improve reception from Neptune

Scientists and engineers from the Jet Propulsion Laboratory (JPL) and the National Radio Astronomy Observatory (NRAO) in Socorro, N.M., are working together in the high plains of central New Mexico to improve the ability to receive spacecraft signals from the vicinity of planet Neptune.

The researchers are testing a new deep-space communications system with the Voyager 2 spacecraft, which will fly past Neptune next year.

When Voyager 2 reaches Neptune in August 1989 to take close-up pictures and thousands of other measurements, the spacecraft will be nearly three billion miles from home. Its signal received on Earth will be

extremely faint.

Adding the 27 radio telescopes of the NRAO's Very Large Array (VLA) to JPL's Deep Space Network (DSN), which communicates with interplanetary spacecraft, will more than double the ability to capture Voyager's signal. The signal will be received eight hours per day for 40 days of the encounter—the period that Voyager and Neptune will be above the horizon at the New Mexico desert site.

Under an agreement between NASA and the National Science Foundation, which sponsors NRAO, engineers are installing new receivers and microwave horns, tuned to Voyager's X-Band radio frequency, on all the 82-foot dish antennas at the VLA. Special signal-processing and communi-

cation equipment has been added so that the VLA will be linked by satellite to the DSN's Deep Space Communications Complex at Goldstone, Calif.

The new X-Band receiver systems were designed and built cooperatively by JPL, VLA, and NRAO's Central Development Laboratory at Charlottesville, Va. Like those of the DSN, the advanced receiver circuits are kept chilled with liquid helium to suppress internal electronic noise. NASA also has provided an independent power generator for the array, which has suffered power failures from summer lightning storms.

This month's system test is the first chance to preview Neptune operations with the whole world-

wide communication system, including elements at the VLA. The Voyager spacecraft, now 2.4 billion miles from Earth, will transmit in its planetary encounter mode, at data rates up to 21,600 bits per second (the rate used for Voyager's encounter of Uranus in 1986). Linked electronically, the two systems—23 VLA antennas that now have their X-Band receivers, and the 112-foot and 230-foot dishes at Goldstone—will function as a single receiving system.

The VLA, located about 100 miles southwest of Albuquerque, has, since 1980, enabled radio astronomers to study distant stars, nebulae and galaxies by collecting and analyzing radio emissions from these objects.

The 27 mobile dishes are

arrayed along a Y-shaped railroad track and can be rearranged for different observations. William D. Brundage, VLA project engineer, is responsible for Voyager preparations at Socorro.

Voyager 2 was launched in August 1977, and has subsequently explored the planetary system of Jupiter, Saturn, and Uranus.

The DSN has been developing and operating as a NASA system for nearly 30 years. It has communicated with spacecraft and astronauts on the Moon; tracked and commanded Earth-orbiting, unmanned spacecraft, and those sent to explore comets and six of the nine planets; and to probe the outer reaches of the solar system.



JSC Photo by Jack Jacob

**SAY CHEESE** — The five astronauts who will fly aboard Atlantis for STS-27 pose for their crew portrait. Seated from left are Pilot Guy S. Gardner, Commander Robert L. "Hoot" Gibson and Mission Specialist Jerry L. Ross. Standing from left are Mission Specialists William M. Shepherd and Richard M. "Mike" Mullane. The STS-27 launch is scheduled for Nov. 17.

## Symposium looks at blacks in science, engineering careers

By Beverly Green

"Why are so few blacks in science, engineering and technology fields?"

JSC and the Center for the Advancement of Science Engineering and Technology (CASET) are making efforts to intervene in the shrinkage of minorities entering the science, engineering and technology fields and will sponsor the first annual symposium designed to include black role models in that process Oct. 11-14 at the Gilruth Recreation Center.

The symposium has been designed to address such questions as: What programs need to be designed to attract minorities to these fields? How effective are existing programs? How can intervention that may lead to better understanding of science, engineering and technology fields be implemented in higher education?

"This symposium will specifically focus on the recruitment and retention of black scientists, engineers and technologists for defense industries and installations," said Dr. John King, chair of

the CASET policy research study. CASET is actually the research arm of Huston-Tillotson College in Austin and is housed in Bldg. 7, Rm. 322 and 323.

"Demographic projections for 1990 to 2020 indicate that the number of 18 to 24 year olds is decreasing in the U.S. population. However, minority population is increasing and minorities are proportionately underrepresented in the science, engineering and technology fields," said King.

Programs are being adopted by the 20 colleges and universities comprising the CASET consortium. These schools include urban universities as Texas Southern University, the host school for this symposium, along with other private and rural institutions throughout the country.

"We began a study to determine and test factors having an impact on the supply of minority and women scientists, engineers and technologists, and designed several symposiums that have been cosponsored by JSC," he said.

"Black Americans in Science, Engineering and Technology" is the final symposium this year of the three part series focusing on the status of Indian, Hispanic and Black Americans in these careers.



King

## NASA seeks bids for Laser Atmospheric Wind Sounder

NASA has issued a request for design proposals for a new, space-based remote sensing instrument to measure wind characteristics, permitting scientists to better understand and contribute to weather predictions on Earth.

The Laser Atmospheric Wind Sounder will be an advanced light detection and ranging (LIDAR) instrument. Just as radar operates by bouncing radio waves off distant objects and sonar bounces sound waves off underwater objects, LIDAR bounces light waves, generated by a laser, off atmospheric particles. Analysis of the reflected light will reveal the direction and speed of the winds and provide information on the amount of particulate matter, known as "aerosols," suspended in the atmosphere.

The sounder will provide real-

time global wind profiles for the lowest weather-producing layer of the Earth's atmosphere. Whether obtained globally using the polar-orbiting Earth Observing System platform or from the tropics and subtropics using Space Station Freedom, the wind profiles will provide essential data to improve understanding of the global biogeochemical and hydrologic cycles, and large-scale atmospheric circulation and climate dynamics. This new information also can be used by weather forecasters worldwide to improve their numerical predictions.

According to Carmine E. De Sanctis, chief of the Space Science and Applications Group at Marshall Space Flight Center, the sounder could be operational by 1996 as one phase of the larger Earth Observing System initiative.

The sounder would enable meteorologists at the National Oceanic and Atmospheric Administration to develop more accurate five-day weather forecasts. At present, severe weather warnings can be issued only for broad areas of the United States.

A major problem is an inability to obtain global wind velocity measurements. "Most atmospheric wind velocity data is obtained using sounding balloons," Dr. Vernon Keller, the sounder's assistant project manager, said. "Unfortunately, most of these balloons are, of necessity, launched from land. More than two-thirds of the Earth's surface, however, is water, thus there exist large areas of the globe—particularly in the southern hemisphere—which receive only minimal measurement coverage."

The sounder will allow world-

wide coverage with special emphasis given to tropical and subtropical areas where, previously, measurements have been sparse to non-existent.

According to Richard Beranek, the sounder's project manager, "It will enable forecasters to obtain wind velocity data from ground level up to an altitude exceeding 40,000 feet. Preliminary concepts involve using a proven carbon dioxide coherent laser, operated at an eye-safe infrared wavelength, to survey winds over Earth's entire surface at least once a day. Data would be provided to meteorologists worldwide to assist in developing weather projections to benefit all mankind."

In addition to weather projections, researchers anticipate the data will help in analyzing the impact natural occurrences and

human activity are having on the environment, Beranek said.

Dr. Keller said the earliest work on the sounder began at Marshall in 1967 with various designs being tested on the ground. In 1981, tests began using a laser atmospheric wind sounder-like system aboard an aircraft. Results obtained during the last 21 years have left Marshall engineers feeling confident in proposing the space-based system.

"We hope to see a design emerge which will be flexible enough to permit us to incorporate state-of-the-art advances in lasers, optics and other related systems as they emerge over the sounder's projected lifespan," De Sanctis said. "The beneficial impact it will have on enhancing our understanding of the environment is certain to be very significant."

## Ellington plans little involvement in coming air show

JSC will display one of its T-38 trainer aircraft on the ground in the upcoming Flight Festival at Ellington Field Sept. 23-Oct. 2.

Kandy Jose, flight management assistant for Ellington, said scheduling problems related to the launch date for STS-26 prevented further involvement by NASA planes and pilots.

An acrobatic flying demonstration will be part of the celebration, but

organizers say strict safety codes will be followed to prevent any accident similar to recent air show disasters in Europe.

The Flight Festival is a 10-day celebration of aviation hosted by the Confederate Air Force, a non-profit organization dedicated to preserving America's aviation history through the preservation of World War II aircraft.

The air show, called "Wings Over

Houston," will be performed Oct. 1 and 2. "We adhere rigidly to regulations imposed and enforced by the Federal Aviation Administration and we regret deeply that occasionally the latitude allowed in other countries results in disaster," said Sam Poss, chairman of the air show's executive committee.

"Our separation of the aircraft and the crowd is set at a different horizontal minimum than Europe," he added.

## Space News Roundup

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

## Launch date set

(Continued from Page 1)

inated with minute particles following a sluggish performance during the flight readiness firing Aug. 10. After their reinstallation, the valves were tested and their performance was acceptable.

Other operations performed at Pad 39B recently included thermal protection system repairs and the installation of shields and carrier panels.

NASA-JSC