

# Space News Roundup

## NASA's work in 1987 built foundation for years ahead

Fletcher says national commitment needed to maintain leadership

"NASA is on the road to recovery and eagerly anticipating the resumption of Space Shuttle flights in 1988," NASA Administrator James C. Fletcher said in his review of the past 12 months.

"We made substantial advances in many areas last year," Fletcher said, "but much of our work was actually building a foundation for 1988 and beyond. The United States can maintain a leadership role in space—with its tremendous importance to science, commerce and national security—but only if the

nation stays truly committed to the space program."

NASA's own commitment to the future was exemplified by its work in 1987 toward the return of Space Shuttle flights. Activities included: the first full-duration test firings of the redesigned Space Shuttle solid rocket motor; a decision to perform a "wet" countdown demonstration test and a flight readiness firing before STS-26; preliminary work on an Orbiter arresting system; completion of contract negotiations with Rockwell International for a

replacement Orbiter; acceptance testing of main engines for STS-26; testing of emergency crew escape systems; and power-ups of both *Discovery* and *Atlantis* at Kennedy Space Center.

The year began on a high note with selection of the crew for STS-26, now scheduled for launch in June 1988. Crewmembers for the four-day flight are Commander Frederick H. Hauck, Pilot Richard O. Covey, and Mission Specialists John M. Lounge, George D. "Pinky" Nelson and David C. Hilmers. The

primary payload is NASA's Tracking and Data Relay Satellite.

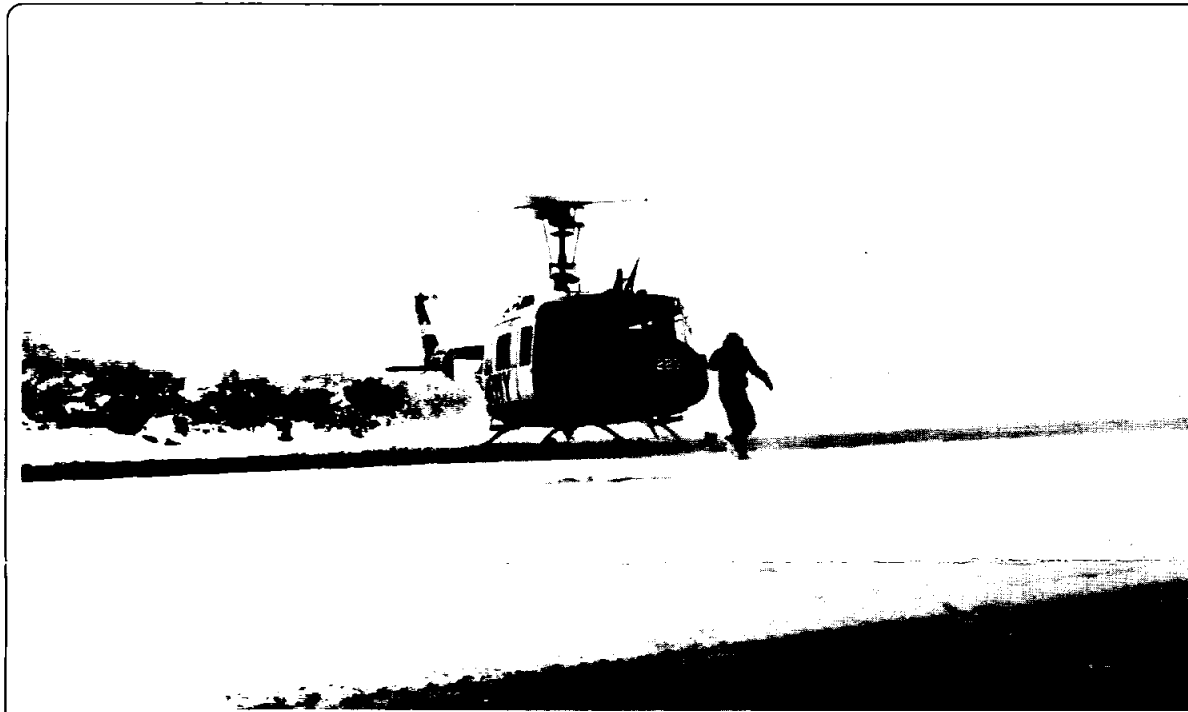
On Feb. 26, GOES-H, a NOAA meteorological satellite, was successfully launched by NASA aboard Delta 179, and Delta 182 successfully carried an Indonesian communications satellite, Palapa-B2P, into orbit on March 20. Both launches were from Cape Canaveral Air Force Station.

NASA's Numerical Aerodynamic Simulation Facility, considered the world's most powerful computing system, became operational in early

March at Ames Research Center. The system opens a gateway to a new area in many types of research, from computational chemistry, astrophysics, aerodynamics and biological research to weather modeling.

On March 26, a tumbling Atlas Centaur vehicle (AC-67), carrying the Navy's FLTSATCOM-6 communications satellite, was destroyed by the Range Safety Officer 51 seconds after launch from Cape Canaveral. An investigation board

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### DECEMBER

An Army helicopter sets down at a snowy White Sands Ground Terminal in New Mexico (above) during one of the last flight readiness exercises of the year for JSC personnel. At right, CapCom Kathy Sullivan, Flight Director Al Pennington and Ground Control Ed Klein operate from their contingency Flight Control Room. Choppers carried equipment and a team of 17 flight controllers from Holloman Air Force Base to White Sands during tests of a plan to set up an emergency Mission Control Center for Space Shuttle missions. An unexpected blizzard closed roads into White Sands, proving the value of using helicopters. Also participating in the exercise were Tim Brown, Ken Patterson, Rich Rodriguez, Kent Joosten, Paul Engelau, Dave Herbeck, Paul Dye, James Webb, Rich Jackson, Gloria Ariaza, Mike Fawcett, Greg Oliver, John Muratore and Beto Sanchez. See Page 3 for the rest of the year in pictures.

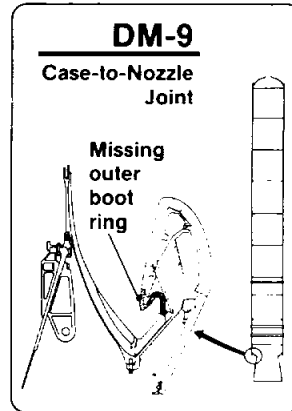


JSC Photos by Paul Dye

## Solid rocket problem delays STS-26 launch

The STS-26 launch date will be delayed because of a problem discovered in the nozzle of Space Shuttle solid rocket Development Motor-9 following a recent test firing, NASA officials said Dec. 29.

Engineers examining DM-9 after the test discovered that material was missing from the nozzle outer boot ring, a large carbon phenolic composite ring used to anchor one end of the flexible boot. About one-third of the missing 160 degrees of ring material was found adjacent to the forward



motors nearing shipment to Kennedy Space Center for STS-26. Until the condition is understood and corrected, the flight motors will be held at Morton Thiokol.

The outer boot ring was redesigned during the solid rocket motor recovery period and DM-9 was its first full-motor test. The redesign involved a new construction technique intended to alleviate carbon material ply separations observed in the original nozzle design.

The second full-duration test firing of the redesigned solid rocket motor

was conducted Dec. 23 at Morton Thiokol's Wasatch facility in Utah. The 126-foot-long, 1.2-million-pound booster was fired horizontally in 25-degree cold for the full two

(Continued on page 2)

## NASA gets \$8.8 billion budget; JSC ramifications under study

Congress and President Ronald Reagan have agreed on a fiscal year 1988 budget that allows \$8.856 billion for NASA, and analysts are working to determine exactly how the new budget will affect JSC and other field centers.

The budget includes a total of \$425 million for Space Station. Members of the House and Senate conference committee capped immediate Space Station spending at \$200 million, and delayed \$225 million of the appropriation pending

a congressional review later in the year.

Virtually all federal agencies and programs received appropriations far under early expectations as a result of deficit reduction efforts.

"NASA believes, given the severe economic climate, this budget reflects the strong commitment of the President and the Congress to proceed with development of the Space Station, and to ensure a viable overall civil space program

(Continued on page 2)

## Space Station letter contracts give companies go-ahead

JSC has awarded McDonnell Douglas Astronautics Co. one of four letter contracts made with the companies selected by NASA to perform detailed design, development, test, evaluation and delivery of Space Station components and systems.

Under the direction of JSC and the three other NASA field centers with Space Station work package responsibilities, the contractors will begin working toward the program's next major milestone, the Program Requirements Review (PRR) that will establish a Space Station con-

figuration to guide the contractors' preliminary designs. The PRR will be conducted this spring. The negotiated cost-plus-award-fee contracts will be signed in the next several months.

McDonnell Douglas, with locations in Houston and Huntington Beach, Calif., will provide the integrated truss structure, mobile servicing system transporter, airlock and resource node outfitting, hardware and software for the data management system, communications and tracking system, the guidance navigation and control

system, extravehicular (EVA) activity systems, the propulsion system, thermal control system, and associated software under Work Package 2. JSC also will provide technical direction for the man-systems work being performed by Grumman Corp. under Work Package 1.

Award of the letter contracts follows Congressional action and the President's approval of the overall funding bill for the federal government under which more than \$500 million will be available in fiscal year 1988 for Space Station development activities. This amount

includes funds remaining available from the FY 1987 appropriation for Space Station development as well as the new funding provided under the FY 1988 bill just approved.

The three other companies issued letter contracts and their respective places of performance are: Boeing Aerospace Co., Huntsville, Ala.; General Electric Co., Astro-Space Division, with locations in Valley Forge, Penn., and East Windsor, N.J.; and Rocketdyne Division, Rockwell International, Canoga Park, Calif.

Under its contract with Marshall

Space Flight Center (Work Package 1), Boeing will provide the U.S. laboratory and habitation modules, logistics elements, resource node structures, airlock systems, environmental control and life support system, internal thermal, audio and video system, and associated software.

General Electric, under its contract with Goddard Space Flight Center (Work Package 3), will provide a free-flying, unmanned polar-orbiting platform and two payload attach points, including a pointing system,

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## People

### Griggs promoted to Rear Admiral

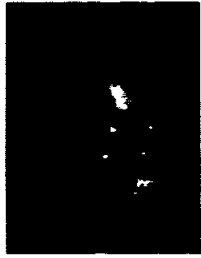
David Griggs, a civilian pilot astronaut, was promoted recently from a Navy Reserve officer to the rank of Rear Admiral, U.S. Naval Reserve. Griggs' current Reserve assignment is as commanding officer for the Office of Navy Research. His current NASA assignment is in support of Space Station operations development. He recently was appointed chairman of the WB-57F incident investigation committee.



Griggs

### Simon honored for secretarial excellence

Yvonne Simon, administrative secretary to the Mission Operations Support Contract Source Board (SEB), has received the Marilyn J. Bocking Secretarial Excellence Award. Simon's innovation with the special graphics and text features of the computer word processing system have resulted in high quality documentation. Countless hours have been saved through her skill with the system. Simon has been responsible for every secretarial activity and provided support required to produce every SEB document and piece of correspondence.



Simon

### Dorsey now in charge of property disposal

Cecil Dorsey has been designated as acting property disposal officer and precious metals and critical materials officer. Dorsey assumes these duties in addition to his responsibilities as chief of the Center Operations Directorate's Equipment Branch due to the retirement of Dorothy H. Starnes. Dorsey's office is in Bldg. 419, Rm. 146A, and he may be reached at x36539.

## Bulletin Board

### Clear Lake Space Society schedules first meeting

The Clear Lake Area Space Society, a chapter of the National Space Society, will hold its first meeting at 7:30 p.m. Tuesday, Jan. 12, in the Spaceweek Office, Rm. 507, NASA Road 1 Quality Inn. For more information, call Chuck DiFalco at x31701 or 333-3763.

### San Jacinto College offers on-site courses

The Human Resources Development Branch has scheduled three academic courses for the spring semester to be conducted by San Jacinto College faculty in JSC's Secretarial Development Center, Bldg. 45, Room 251. Courses include: Basic Business Communications, Tuesdays from 1 to 4 p.m.; Public Speaking, Wednesdays from 1 to 4 p.m.; and Elementary Accounting I, Thursdays from 1 to 4 p.m. A JSC form 75 must be submitted to enroll. A member of the San Jacinto College staff will be at JSC in Bldg. 45, Room 551, from 1 to 3 p.m. Jan. 5 to register employees. For more information, contact Joan Walgamuth at x35266.

### JSC night at the Summit scheduled Jan. 16

JSC-EAA night at the Summit will be Saturday, Jan. 16. The Houston Rockets will take on the Indiana Pacers. Tickets will be sold at the Bldg. 3 cafeteria from 10 a.m. to 2 p.m. on Jan. 12. Purchase is limited to eight tickets per person and a NASA-issued badge is required.

### Bay Area PC Organization to meet Jan. 26

The next meeting of the Bay Area PC Organization (BAPCO), the local IBM PC users' group, will be at 7:30 p.m. Jan. 26, at the League City Bank & Trust, 303 E. Main, League City. The group is open to people interested in microcomputers and meets regularly on the third Tuesday of each month. For more information call Earl Rubenstein, x34807, or Jack Calvin, 326-2983.

### Society of Professional Engineers sponsors fellowship

The Professional Engineers in Government division of the National Society of Professional Engineers is sponsoring a \$1,000 Fellowship for an engineer pursuing advanced studies in management. The fellowship is available to an engineer-in-training or a registered professional engineer from any discipline who is accepted or enrolled in an accredited masters degree program in Engineering Management or Public Administration. Application deadline is Feb. 1. For applications or information, call Diane DeTroye, x35266.

## Space News Briefs

### Orbiter Atlantis powers up

*Atlantis* was electrically powered up December 9 for 10 months of tests and processing before its scheduled launch in September 1988 for STS-27. "Everything went great," said Conrad Nagel, an engineer in charge of *Atlantis*' processing. The shuttle *Discovery* is scheduled to blast off in June; *Atlantis* is next off the pad with a secret military satellite as its payload.

### Ames makes largest wind tunnels operational

The world's two largest wind tunnels recently became fully operational at Ames Research Center. The wind tunnels, housed in the National Full-Scale Aerodynamics Complex (NFAC), provide unique facilities for full-scale and large-scale testing of advanced aircraft, closely simulating actual flight conditions.

### Culbertson to retire in mid-January

Philip E. Culbertson, associate administrator for policy and planning, will retire from NASA Headquarters in mid-January. He will become president of the Lew Evans Foundation, which was established in 1983 in tribute to the late president and board chairman of Grumman Corp. Culbertson served the American space exploration program for 22 years in high-level technical and policy positions.

### NASA helps community meet water standards

NASA research being conducted at the National Space Technology Laboratories (NSTL) in Mississippi is helping the small community of Monterey, Va., meet state and federal wastewater treatment standards. NSTL's Dr. B.C. Wolverson suggested Monterey connect its existing aquaculture pond to a microbial filter system with vascular aquatic plant forms, a technology he developed for pollution abatement and future space applications. The connection gave Monterey an affordable way to meet Clean Air Act effluent standards.

## Investigation probes Ellington incident

Astronaut S. David Griggs has been appointed chairman of an incident investigation committee that will examine the Dec. 17 landing of a NASA high-altitude research aircraft that ran off a runway at Ellington Field in Houston.

Also on the committee are Steven J. Feaster, pilot representative; Glenn O. Pingry, maintenance representative; Harry A. Drott, quality assurance representative; and David L. Mumme, aviation

safety officer. Daniel L. Clem of the Safety, Reliability and Quality Assurance Directorate's Safety Division, will assist the committee.

The aircraft was a General Dynamics WB-57F, piloted by Michael Corbett and Albert Crews, both Aircraft Operations Division pilots. Corbett was flying the aircraft at the time of the incident. No one was injured, and damage to the aircraft was minimal.

The NASA WB-57 is associated

with Project Airstream, a long-term NASA/Department of Energy multi-disciplinary study of the upper atmosphere and also is used to collect "cosmic dust" samples for the Solar System Exploration Division at JSC.

The WB-57F NASA 928 Incident Investigation Committee has been directed to report its findings to JSC Director Aaron Cohen by Jan. 31, 1988.

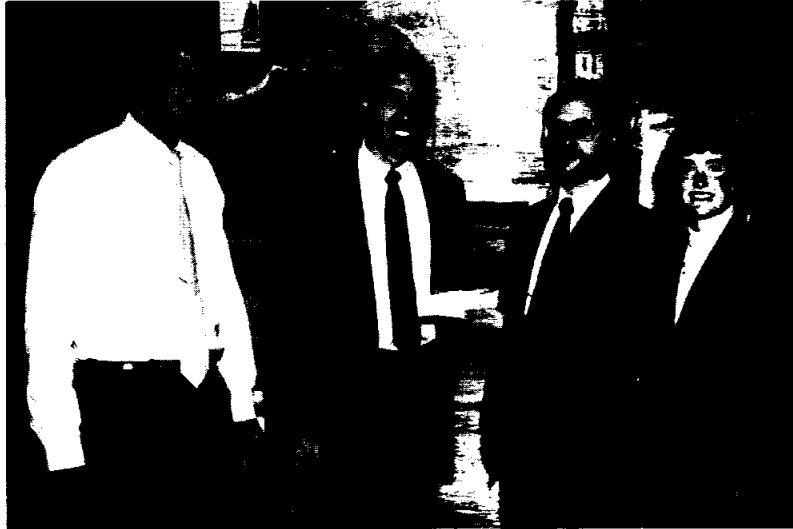
## White Sands is alternate runway

White Sands Space Harbor, N.M., formerly known as Northrup Strip, has been designated as an alternate end-of-mission landing site for Space Shuttle missions STS-26 through STS-28.

The alternate site would be used for a Shuttle landing if conditions were present that precluded a nominal end-of-mission recovery on lake bed Runway 17 at Edwards Air Force Base, Calif., the primary landing site.

The landing site options will be reassessed after completion of the next three flights, when data on the improved Shuttle brakes and other technical issues have been analyzed.

The White Sands site was previously used on STS-3, the third orbital test flight, at its conclusion on March 30, 1982.



JSC Photo by Kim Murray

Representatives of the 1987 Mission Operations Directorate Olympics Committee present a \$500 donation to David Williams, director of the Houston Food Bank. From left to right are Curt Carlton, Williams, Rich Owen and Kimberly Spurgeon. The proceeds from this year's MOD Olympics will help distribute food and paper products to the Houston needy.

## JSC analysts evaluate budget alternatives

(Continued from page 1)  
for the future," NASA Headquarters officials said.

Deputy Administration Director Wayne Young said all the new budget's consequences for JSC

probably won't be known until later this month.

"What we're doing is running a number of different alternatives because the biggest uncertainties for us are going to be in the Space

Station and R&PM (Research and Program Management) activities," Young said. "We are running a number of different budget scenarios to determine potential program schedule effects."

## Main engine acceptance tests complete

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minutes required in flight. The test was designed to further evaluate the performance of major design features, including the capture feature field joint, bonded field joint insulation, joint heaters and radially bolted case-to-nozzle joint design.

Among the initial test data that indicated the redesigned motor had

performed properly were an important pressure time trace showing that the motor burned exactly as predicted and temperature readings showing that heaters kept joints at 85 to 90 degrees.

Another Dec. 23 return-to-flight development was the successful full-duration test of Space Shuttle main engine No. 2028 at the National Space Technology Laboratories.

The 520-second test completed acceptance testing of all three engines slated to fly on STS-26.

Initial indications were that the engine performed within limits, but a routine post-firing evaluation is under way and must be completed before full test results are known. The mission-duration firing had been preceded by two shorter tests earlier in December.

## NASA signs Space Station letter contracts

(Continued from page 1)

for accommodating scientific instruments on the manned base. GE is also responsible for integration of the Flight Telerobotic Servicer to the Space Station, appropriate Space Station Information System activities, associated software, and for planning NASA's role in satellite

servicing.

Under its contract with the Lewis Research Center (Work Package 4), Rocketdyne will provide the electric power system for the Space Station. This system includes power generation and storage, management and distribution of electrical power, and associated software.

Rocketdyne is also responsible for providing solar arrays, battery assemblies and common power management and distribution components for the polar platform, and for performing a proof-of-concept test for a possible future solar dynamic power system utilizing the Brayton cycle system.

## Space science highlights busy year

(continued from page 1)

determined that an electrical transient, caused by a triggered lightning flash, was the most probable cause.

Also in March, NASA and General Dynamics Corporation signed the first U.S. Government agreement transferring operation of a government-developed ELV to the private sector. The agreement transferred to General Dynamics authority to use NASA-controlled facilities and capabilities for commercial manufacture and launch of the Atlas/Centaur vehicle.

On April 15, the United States and the Soviet Union signed a bilateral agreement on civil space cooperation. The agreement calls for cooperation in 16 specific project areas to be carried out by joint working groups in space science in solar system exploration, space astronomy and astrophysics, Earth sciences, solar-terrestrial physics and space biology and medicine.

On June 1, creation of the Office of Exploration to coordinate agency activities that would "expand the human presence beyond Earth," was announced.

The new NASA Safety, Reliability, Maintainability, and Quality Assurance organization (SRM&QA) in June established a voluntary, confidential safety reporting system for its 100,000 employees and contractor personnel to alert NASA management of safety concerns.

In late July, NASA completed negotiations with Rockwell International to build a replacement Orbiter. Using existing structural spares for construction, OV-105 is scheduled for completion in the spring of 1991.

In August, a group headed by NASA Astronaut Dr. Sally K. Ride released the results of their studies of possible initiatives in pursuit of a new national space objective. The group's final report, "Leadership and America's Future in Space," identified four major possibilities for concentrated examination.

During the late summer, an extensive campaign to study the causes of ozone depletion in our atmosphere over Antarctica was led by NASA in cooperation with other organizations.

Supernova SN 1987a, a blue supergiant and the brightest supernova to

occur in over 400 years, was discovered. NASA mounted a massive campaign to study the phenomenon, which may answer many theories about the birth of a solar system.

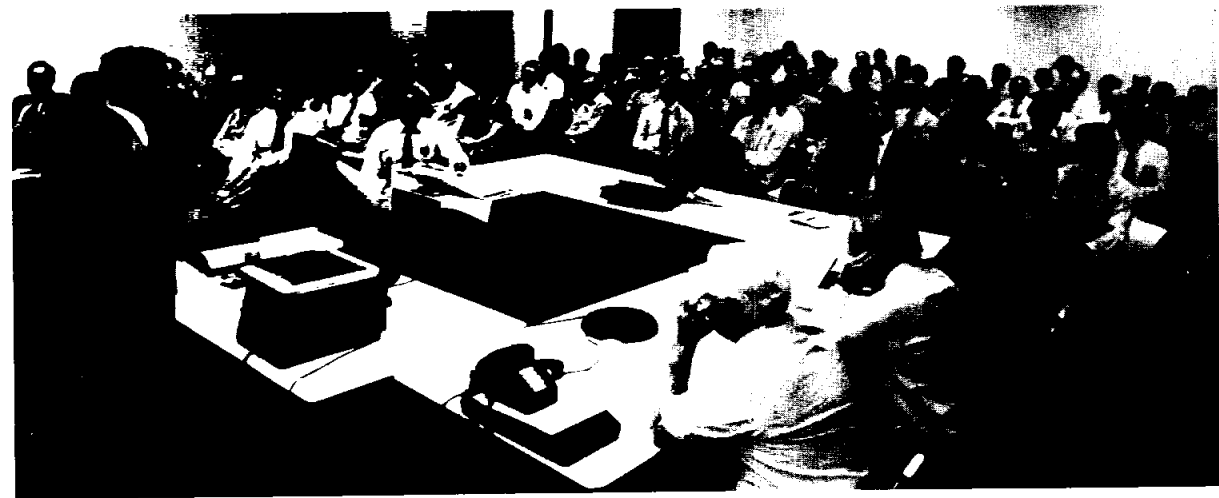
In September, the crew was selected for STS-27, a Department of Defense mission targeted for the fall of 1988 aboard the *Atlantis*. Crew members are Robert L. Gibson, commander; Guy S. Gardner, pilot; and Richard M. Mullane, Jerry L. Ross and William M. Shepherd as mission specialists.

On Sept. 16, NASA successfully launched a pair of navigation satellites for the Navy aboard a Scout-209 vehicle. Launch of the Stacked Oscar on Scout was from Vandenberg Air Force Base.

In October, a new space flight manifest was issued that reflected the "mixed-fleet" concept—resulting from a major reevaluation of the role of expendable launch vehicles in concert with Shuttle missions.

On Dec. 1, NASA selected four aerospace firms to design and develop the components and systems comprising the permanently manned Space Station to be placed in Earth orbit in the mid-1990s.

# 1987: THE YEAR IN PICTURES



JSC Director Aaron Cohen kicked off the centerwide effort to develop a Strategic Game Plan. The plan was formally adopted in October.

## JANUARY



## NOVEMBER

Hurricane-force winds and heavy rain damaged this truck and about three dozen other automobiles at JSC and Ellington Field. Four people were treated for minor injuries at the JSC Clinic.

## FEBRUARY



Old black Southwestern Bell telephones that had served JSC for decades were carted out of buildings following their replacement by the flashy new computerized Rolm phones.

## SEPTEMBER



Bob McNeil and Ethel Jarden got their backs—and their faces—into the tug-of-war at the third annual Mission Operations Directorate Olympics at the Gilruth Recreation Center.

## OCTOBER



Members of the Senate Subcommittee on Science, Technology and Space toured Bldg. 9A with Aaron Cohen after hearing testimony on space commercialization at JSC.

## AUGUST

Dr. Mae Jemison, one of 15 new astronaut candidates, learned how to direct rescue helicopters during wilderness survival training in a northern Idaho forest.

## MARCH

STS-26 crew members (left to right) Pinky Nelson, Dave Hilmers, Mike Lounge, Dick Covey and Rick Hauck prepared to enter the Shuttle Mission Simulator and begin training for the return to flight.



Mike Jordan, Space Station marketing manager for McDonnell Douglas, checked off boxes as the contractor's proposal was delivered to the Vanguard Bldg. McDonnell Douglas won JSC's Space Station Work Package 2 contract.

## APRIL

The crew of the STS-61M(T) long-duration simulation got ready to earn their carrots by working through 180 malfunctions with flight controllers. Clockwise from left are Mike Coats, John Blaha, Jim Buchli, Bob Springer and Anna Fisher.



## MAY

Evidence of JSC's new limited smoking policy sat in a stairwell in Bldg. 1. Guidelines now prohibit smoking in public areas and shared offices.



The Enterprise was called back into service at Dulles International Airport outside Washington, D.C., for tests of a Shuttle arresting net, one of several proposed landing aids.

## JUNE



# Roundup Swap Shop

All Swap Shop ads must be submitted on a JSC Form 1452. The forms may be obtained from the Forms Office. Deadline for submitting ads is 5 p.m. the first Wednesday after the date of publication. Send ads to Roundup, AP3, or deliver them to the Newsroom, Bldg. 2 Annex, Room 147. No phone in ads will be taken.

## Property & Rentals

Lease: Galveston beach house, 2-2, beach 100 yds., boat landing 4 blocks, marina w/pool, \$500/week, weekend rates available. Fendell, 481-0679.

Lease: Galveston gulf front, 1 BR, sleeps 6, fully furnished, TV, stereo, weekend rate, \$75. Glen, 280-8644.

Sale: Kirkwood South, large custom built 2 story, 4-2.5-2, both formals, family room w/FPL, intercom, walk-in closets, fans, new 4-ton AC, oversized cul-de-sac lot, \$81,500. Morrey, 488-5210.

Lease: 2 BR condo, next to NASA, W/D conn., ice maker, fans, miniblinds, cable TV, storage room. Cecil, 488-0719.

Lease: Baywind II, 2-2.5, large 2 story, new kitchen floor, fresh paint, FPL, W/D, fans, pool, tennis, \$470/mo. Jeff, x30715 or 280-8608.

Sale: 4-2-2, split plan, paneled den w/FPL, 1/2 block from elementary school, close to I-45, convenient to Hobby Airport, downtown, \$57,000. Koepke, 488-3383 or 481-5465.

Lease: 1-1 condo, Tranquility Lake, fan, FPL, W/D, appliances, security gates, pools, jogging trail, fishing \$350/mo. Angela, 486-4466.

Lease: 3-1.5, 2 story townhouse, corner unit, fenced yard, covered parking, quiet neighborhood w/pool, basketball, tennis and playground, \$475 per mo., available mid-December. Angela, 486-4466.

Lease: Baybrook condo, 1 BR, W/D, covered parking, convenient shopping, easy access to I-45. Bill, 333-4580.

Lease: Nassau Bay, 3-2-2, den, family room, living room, dining room, walking distance to NASA. \$650/mo., available Jan. 15. Duke, 488-4493.

Sale: 3-2-2, buy from owner below market, \$48,000. Quinn, x35596 or 481-0289.

Sale: Kemah, League City area, 3-2 country home, 1.33 acres, garage, carport combination, hi-eff. A/C, deep well, near Hwy. 518, \$90,000. Nelson, 334-1883.

Sale: Kemah, 1.5 acre lot on Lewis Dr., \$8,300. Nelson, 334-1883.

Lease: El Dorado Trace condo, 1 BR, study, split plan, new carpet, appliances, refrigerator w/ice maker, pools, tennis, whirlpool, no pets, available Jan. 1, \$350/mo., deposit. Yang, 480-1492.

Lease: Baywind II, 1 BR, new carpet/flooring, W/D, FPL, tennis, no pets, low deposit, free half month, \$285/mo. Chuck, 488-5019.

Lease: Dickinson Bayou 2-2.5-2 townhouse, 1,850 sq. ft., den, utility room, walk-in closets, balcony, patio, pool, tennis, boat ramp, \$550/mo. Kohrs, 337-1027.

Sale: 2-2.5 townhouse, close to NASA, master BR unique design, courtyard, pool. Brenda, 333-9475 or 333-5874.

Sale/Lease: Lake Livingston waterfront lake house, on Indian Hills peninsula, 85' fishing pier. Jerry, x39287 or 554-6093.

Lease: Camino South, 3-2-2, split bedroom, FPL, new carpet, fans, fenced, available Jan. 15, \$550/mo., \$300 deposit. Lyn, x37916 or 333-2359.

Mobile home, 14' x 70', 3-1.5, good shape, miniblinds, skirted, fence, Pearl and park, \$7,500. Michael, 280-7344 or 485-5339.

Sale: 13.5, gently rolling wooded East TX land, fronts county blacktop near Tyler and Henderson, assumable low cost TX. Vet. loan. McLeish, 480-7445.

## Cars & Trucks

'86 Mazda RX7, 17K mi., 5 spd., rotary, AM/FM/cassette, AC, power sunroof, rear window louvers, ex. cond., \$13,500. 480-0907.

'72 Volvo, mint green, 2 dr., 4 spd., pioneer FM stereo, good tires, good cond., \$1,000. Rena, x32479 or 280-8386.

'81 Corvette, new tires, battery, good cond., \$7,000. Alan, 280-1259.

'63 Pontiac Catalina, good body and interior, need tires and engine work, \$700 OBO. 482-1423.

'85 Red Firebird, AC, PS, PB, red, ex. cond., \$5,000. James, 333-7098 or 334-1221.

'68 Camaro, no engine, transmission or interior, few dents and rust, overall good cond., BO. Merrell, x37570.

'85 Subaru GL-10, elect sunroof, digital displays, loaded AM/FM/tape, \$7,300. Stonesifer, 488-0515.

'84 Ford Thunderbird, 302 V-8, loaded, overdrive, positraction, premium sound, theft alarm, ex. cond., 54K mi., \$6,500. Bob, x33239 or 485-1239.

'85 Toyota, MR-2, sunroof, 5 spd., ex. cond., \$7,600 OBO. Landon, x34618.

'78 Toyota Cressida station wagon, \$700. Whitehead, x35055 or 474-2906.

'81 Datsun 280ZX, loaded, T-tops, new brakes, new clutch, \$4,500.

Whitehead, x35055 or 474-2906.

'80 Olds Toronado, power moonroof, Kenwood cassette, loaded, 67K mi., \$3,995. Jerry, x38922 or 333-9003.

'85 Subaru GL-10, power sunroof, digital displays, all power, electric options, AM/FM/tape, \$7,300. Greg, 280-7341 or 488-5015.

'73 Thunderbird, V8, loaded, leather, 81K mi., white, black vinyl top, \$2,000. Kevin, x33838 or 471-7889.

'84 Ford Ranger pickup V6, Texas Lariat, loaded, DLX Camper Shell, 32K mi., 2 tone w/strip G, ex. cond., make offer. John, 488-4487.

'81 Dodge Colt, new tires, 38K mi., ex. cond., \$1,900. Zupp, 482-7156.

'77 Pontiac Grand Prix, 91K mi., \$1,500. Zupp, 482-7156.

'72 Volvo, mint green, 2 dr., 4-spd., Pioneer FM stereo, good tires, good cond., \$1,000. Haldiman, x32479 or 280-8386.

'81 Corvette, yellow, new tires, battery, body and engine good cond., \$7,000. Alan, 280-1259.

'85 Dodge Caravan LE, auto, A/C, AM/FM, power windows, doors, velour interior, trailer hitch, gold dust color, ex. cond., \$9,530. Kaltenbach, 282-6318 or 331-5751.

'80 Trans Am Firebird, black/gold, low miles, make offer. Chris, 333-3856.

'84 2 dr. Ford Tempo, 38K mi., PS, PB, A/C, cruise, new tires, brakes, battery, AM/FM, brown/tan, \$4,400 OBO. Larry, x38004 or 554-2209.

'81 Regal Limited, ex. cond., 77K mi., beige, \$2,975. Jim, x30952 or 486-4070.

'82 Mazda GLC, 3 dr. HB, 5 spd., A/C, sunroof, AM/FM/tape, good cond., \$2,100. Joe, x33559 or 996-1667.

## Boats & Planes

'81 90 hp Evinrude motor, power tilt, low hours, 17' Glastron, galvanized trailer, \$1,500. Kohrs, 337-1027.

'72 Wellcraft, 18', Johnson O.B. 140 hp, galvanized trailer, tilt/trim, (2) 16 gal. tanks, power winch, \$500. Marek, 331-2422.

Sears fiberglass canoe, ex. cond., \$125. Dean, 332-2229.

## Cycles

New Panasonic men's bike, green and white, 21", double butted, CR-MO Tange 900 (frame), Shimano platform pedals, light action shifting, seal system hub, quick release front and rear wheels, extra set of tubes, was \$365, now \$250.

'81 Yamaha, 850-S, 19,000 miles, ex. cond. James, 333-7098 or 334-1221.

'85 Suzuki moped, FA-50, 300 mi., ex. cond., Stonesifer, 488-5015.

'82 Kawasaki Jet Ski 440, Dilly trailer, ex. body cond., needs tune up, limited usage, \$1,500 OBO. '83 Suzuki GS550E, orig. owner 5637 mi., ex. cond., \$1,250 OBO. Jana, x51653 or 523-3008.

'81 Yamaha, 850-S, 19K mi., ex. cond. James, 333-7098 or 334-1221.

'84 Suzuki 1254 wheeler, \$700. Robert, x39170 or 482-7835.

## Audiovisual & Computers

Vic 20 computer, 2 games, B&W TV monitor, joystick, ex. cond. Kevin, x33838 or 471-7889.

Commodore 64C, terminal, keyboard, floppy disk drive, 1200 baud modem, \$450. Carolyn, x32123.

HP Digital Cassette drive for HP-41C, HP-IL interface module, ex. cond., was \$675, now \$400. Klipschorn loudspeakers, \$1,900. Carlos, x38879.

## Household

Sears 19' frostless, ice maker, avocado, good cond. Ethel, x36148 or 332-5830.

Bunk beds, mattresses, ex. cond., \$150. Sigafosse, 554-6242.

Rugs, 2 light blue, shag—11' x 16', \$60 ea; green shag 9' x 12', \$25; barbecue charcoal: (Char-Broil) \$25; stainless steel kitchen knobs—24; miscellaneous kitchen & household items. Terry, x30550 or 333-2985.

Jenn Aire range grill cartridge, \$90; Jenn Aire range griddle, \$20. Fred, 333-2166 or 282-4262.

Curved bar, butcher block finish, chrome foot rest, thick padded elbow rests, 2 matching swivel stools, \$200. Jim, 538-1845.

Frostless refrigerator/freezer, almond, 16.4 cu. ft., ex. cond., 2 yrs. old, auto icemaker hookup, doors reversible, under warranty, \$375 OBO. Marie or Ken, 333-2783.

General Electric Dryer, ex. cond., heavy duty, \$150. Beth Ann, 333-6191.

Contemporary oak coffee table, smoked glass inlaid, ex. cond., \$80. Nelda, x39283.

General Electric refrigerator w/ice maker, \$350; 6 designer chairs, yellow/tan plaid, \$150; General Electric W/D,

\$150, game table, \$35; 2 end tables, \$50; couch, \$50; king-sized water bed, \$100. Reed, x36580 or 471-6613.

Sewing machines, portable zig zag, (1) Sears model 1227, \$85; (1) Singer model 347, \$50. Owens, x33167.

Kenmore W/D, 8 mos. old, \$125 ea. Villars, 930-1509.

Sears refrigerator, gold, 17.1 cu. ft., double door, frost free, icemaker, \$175; white single door, \$100. Jacci, 326-1722.

Sealy twin bed, mattress, boxspring, foundation, good cond., bedspread and sheets, \$75. Larry, x38004 or 554-2209.

Full motion queen-sized waterbed, bookcase headboard, 6 drawers underneath, heater, bumper pads, mattress pad, sheets, ex. cond., \$225. Ghormley, 331-7360.

## Wanted

Want to buy solid white or cream couch, good cond. Monica, 280-1259.

Want to purchase used baby crib in good cond. Debra, x35256 or 931-1651.

Want cast iron weights, no vinyl coat, entire set or extra plate. Brad, x31678 or 338-1252.

Want acoustical guitar. John, x36428.

Want roommate to share 2-2, W/D, FPL, \$200/mo. Scott, x36891.

Want roommate to share 3-2 in Friendswood, W/D, cable, microwave, household privileges, non-smokers, \$245/mo., all bills paid. Michael, 483-8169.

Want photographic studio equipment, lights, stands, umbrellas, backgrounds, tripods, cameras, props. Michael, x38169 or 482-8496.

Want wood game table. Bob, x35795 or 480-5714.

25 yr. old male seeking dock space at private home for a 38' power boat, in exchange for either rent or work, owner lives aboard, quiet and responsible. Bill, 474-4908 or 462-5000.

Want to buy electric trains. Don, x37832 or 996-1425.

## Musical Instruments

Lowry Coronation console organ, ideal small church or serious student, \$800 OBO. Pierce, 480-3110.

## Pets & Livestock

Silver agouti, American short-haired Guinea pig, 20-gal. long aquarium, heater, food bowl, water bottle, \$25. Rich, x35137.

AKC Cocker Spaniel pups, 2 females, 2 males, black and white, born 9/27/87, \$125 ea. Oppeltat, x36159 or 472-6323.

Lab pups, 2 choc., 5 black, hunting breed, will be ready for new year, \$50 deposit will hold, \$150 ea. Beverly, 559-2112.

## Photographic

Nikkormat FT2 35 mm camera, 50 mm lens, leather case, \$150; Nikon F camera body, \$160. Carrington.

Canon zoom lens FD 100-200 mm f 1:5.6 w/case, \$125. Nering, x31382 or 481-0608.

## Personals

Retirement luncheon for Ed Wheeler of Bldg. 5 Tuesday, January 12, 1988, Gallagher's. Bill, x34428 or Maurice, 32952.

## Miscellaneous

Ping pong table, \$100; typewriter, portable, manual Torpedo, \$50. Terry, x30550 or 333-2985.

Ruger .44 Magnum carbine w/Redfield 4X wide angle scope, together or separate; Smith & Wesson 1000 12 Ga., auto 30" barrel w/full choke.

Golf irons, Confidence II, stiff shafts, match set of 1970 Vintage 1-SW, \$250 OBO; 1, 3, and 5, Personal Make, Persimmon Heads, extra stiff graphite shafts, \$200, OBO 280-5225.

Credenza, black metal, wood grained top, 60" x 20", sturdy, like new, \$100; waterford crystal Christmas ornament, 1978, first year issued, \$20. Linda, x34044.

Amplifier, new, Dean Markley, model K-20, \$99. Andrea, x35254 or 532-1581.

Credenza, black metal, wood grained top, 60" x 20", sturdy, good cond., \$100. Bennett, 34044.

8' fluorescent lights. Jerry, x39287.

Camel tent, 2 person, dome style, good cond., \$25 OBO. Marie or Ken, 333-2783.

Stereo console, dark wood finish, AM/FM, ex. cond., \$40. Jim, 538-1845.

4 chrome rims, universal 15" x 7", ex. cond., \$90. Debra, x35256 or 931-1651.

red paisley drapes; Monte Carlo wire covers. Ethel, x36148 or 332-5830.

SPA-310 gallon, 6 seats, 1.5 hp pump, air compressor w/250 BTU, pool, gas heater, \$2,500. Whitnah, 481-2854.

Wood, reasonable prices. Aven, 482-7835.

Rear overload springs for half-ton pickup, leaf springs, no modification to original suspension required, \$50. Pringle, 482-7160.

Aluminum extension ladder, 20' ext., \$65; cedar chest, \$85; large trunk, \$95; camera Argus lightmeter, lenses in case, \$125; Texas instrument, programmable electronic slide rule calculator, ex. cond. BO; stereo AM/FM, quatravox 4 channel synthesizer, 4 new single speakers, \$125; twin bed, mattress, box springs, frame, \$75; white plastic table 30" x

12", stackable \$3.50, 25 pcs. on hand, chest of drawers, ex. cond., \$95. Pryor, 326-3095.

Sega master system and 1 cartridge, less than 10 hrs., \$75; pool table 3/4", slate top, \$300. Beverly, 559-2112.

Surplus U.S. commemorative stamps, mint cond., 5% below face value, \$20; 8% below face value for \$100. Jeff, 333-7017 or 482-5393.

Fluke hand-held digital multimeter, new, \$95. Joe, x33559 or 996-1667.

DP Gympac 2000 Fitness System, wall mount, bench, 110 lbs. weights, attachments for bench press, leg curls, ex. cond., \$175. Linda, x33844 or (409) 925-4862.

VW type I parts, complete doors, gas tanks, most engine parts, service available. Ray, x30823 or 554-5435.



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## Gilruth Center News

Call x30304 for more information

**Weight safety**—This is a required course for those employees wishing to use the Rec Center weight room. The class will be Jan. 13 and 28.

**Country and western dance**—Beginning class starts Jan. 25 and continues every Monday from 7 to 8:30 p.m. for six weeks. Cost is \$20 per couple.

**Defensive driving**—Course is offered Jan. 16 and Feb. 20 from 8 a.m. to 5 p.m. and costs \$20.

**EAA badges**—Dependents and spouses may apply for photo identification badges between 6:30 and 8:30 p.m. Jan. 5, and 20.

## Cookin' in the Cafeteria

### Week of January 4 -8, 1988

**Monday** — French Onion Soup; Beef Chop Suey, Polish Sausage w/German Potato Salad, Breaded Veal Cutlet (Special); Okra & Tomatoes, Green Peas. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

**Tuesday** — Split Pea Soup; Salisbury Steak, Shrimp Creole, Fried Chicken (Special); Mixed Vegetables, Beets, Whipped Potatoes.

**Wednesday** — Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised Beef Rib, BBQ Plate, Wieners & Beans, Shrimp Salad, Stuffed Bell Pepper (Special); Corn O'Brian, Rice, Italian Green Beans.

**Thursday** — Chicken Noodle Soup; Beef Stroganoff, Turkey & Dressing, BBQ Smoked Link (Special); Lima Beans, Buttered Squash, Spanish Rice.

**Friday** — Seafood Gumbo; Broiled Turbot, Liver & Onions, Fried Shrimp, Meat Sauce & Spaghetti (Special) Green Beans, Buttered Broccoli, Whipped Potatoes.

### Week of January 11 - 15, 1988

**Monday** — Beef & Barley Soup; Beef Chop Suey, Breaded Veal Cutlet w/Cream Gravy, Grilled Ham Steak, Wieners w/Baked Beans (Special); Buttered Rice, Brussels Sprouts, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

**Tuesday** — Celery Soup; Fried Shrimp, Pork Chop w/Applesauce, Turkey a la King, Pepper Steak (Special); Au Gratin Potatoes, Breaded Squash, Buttered Spinach.

**Wednesday** — Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised Beef Ribs, Mexican Dinnér (Special); Spanish Rice, Ranch Beans, Buttered Peas.

**Thursday** — Green Split Pea Soup; Corned Beef w/Cabbage & New Potatoes, Chicken & Dumplings, Tamales w/Chili, Hamburger Steak w/Onion Gravy (Special); Navy Beans, Buttered Cabbage, Green Beans.

**Friday** — Seafood Gumbo; Deviled Crabs, Broiled Halibut, Liver & Onions, BBQ Link (Special); Buttered Corn, Green Beans, New Potatoes. SANDWICHES

On Wednesday we feature The Reuben: Corned Brisket, Swiss Cheese on a bed of Sauerkraut, Poupon Mustard on Rye and 1/4 Pickle. Delicious!

Monday and Thursday check out our French Dip Sandwich.

NASA  
Lyndon B. Johnson Space Center

## 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 other Friday by the Public Affairs Office, for all space center employees. **Roundup** deadline is the first Wednesday after publication.

Editor: Kelly Humphries  
Staff Writer: Beverly Green

