

Space News Roundup

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National Aeronautics and Space Administration

PLSS failures identified, EVA set for STS-6

A faulty fan motor sensor and two missing locking devices have been blamed for the problems with two spacesuits which forced cancellation of the extravehicular activity (EVA) on STS-5.

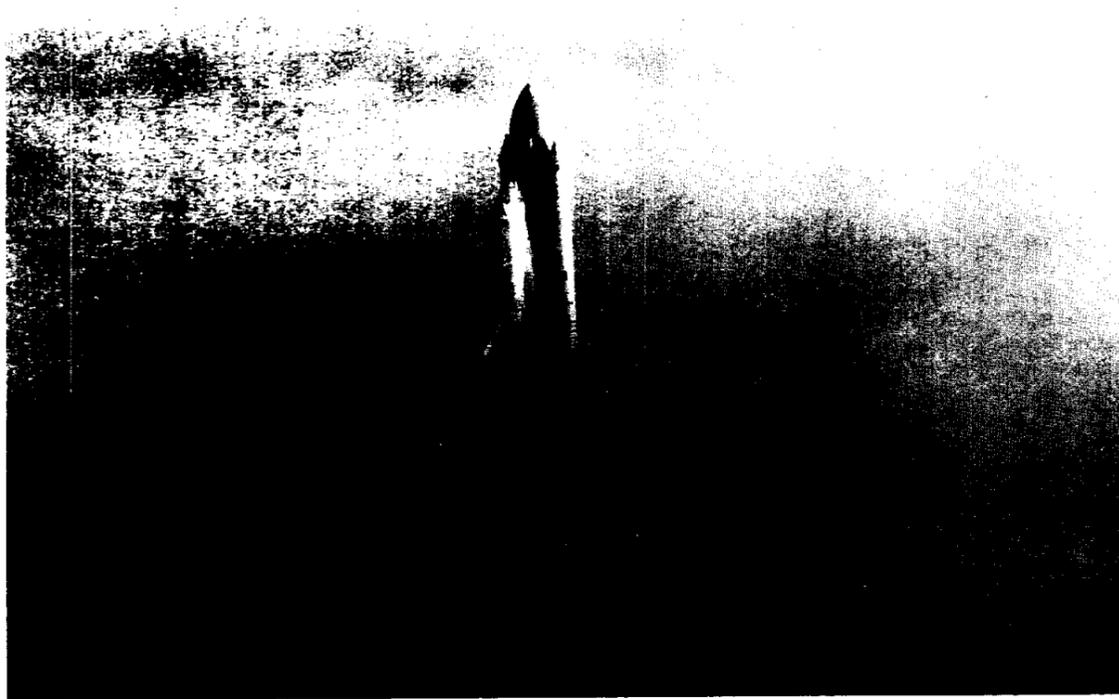
A sensor regulating the speed of a fan motor in Mission Specialist Joe Allen's Portable Life Support Subsystem (PLSS — the spacesuit backpack) apparently was degraded by moisture of undetermined origin. The sensor is used to monitor the magnetic current of the fan motor, and when it failed the motor stuck in a mode which Allen described as "motorboating."

The NASA investigating team also reported last week that two locking devices used to help control pressure in the spacesuit of Mission Specialist William Lenoir were missing from the spacesuit, although documentation from the contractor indicated the parts had been installed. The team, headed by Richard A. Colonna, Manager of the Program Operations Office here, said the two vital parts were apparently left out of the pressure regulator in Lenoir's PLSS during

assembly last August by Carlton Controls, Inc. of East Aurora, NY. This resulted in Lenoir's suit having a pressure level of 3.8 psi rather than the planned 4.3 psi level.

Shuttle Program officials have now officially extended STS-6 from about 72 hours to about 55 days 55 hours to allow for another try at an EVA. Mission Specialists Story Musgrave, EV1, and Don Peterson, EV2, are scheduled to make two translations of *Challenger's* payload bay, evaluate suit mobility and communications and perform various tasks related to the payload cradle, a payload restraint device and tests in translating with a mass.

The investigating team will continue its inquiry and is expected to recommend measures designed to increase quality control. More frequent and intense testing during space suit production at Hamilton Standard, the primary contractor, Carlton Controls and at JSC and the Kennedy Space Center will be recommended, Colonna said.



It was a surrealistic rollout at the Cape recently when the new orbiter Challenger inched toward Launch Pad 39A amidst a dense morning fog. The six-hour trip to the pad was uneventful, despite the low visibility. Launch of Challenger on its first trip into space for the STS-6 mission is now scheduled for no earlier than Jan. 24.

A piece of Mars

Years after it arrived, data suggests rock is from the Red Planet

A debate underway within the planetary science community since the 1970s may be taking a new turn as recent studies at JSC add evidence to the contention that at least one and possibly nine meteorites found on Earth are from the planet Mars.

If so — and scientists are quick to say that the only conclusive proof would have to come from the surface of Mars itself — the samples could represent the most significant objects to be studied here since the return of rocks from the Moon by the crew of Apollo 11.

The scientific detective story goes back to Chassigny, France, where a meteorite was found in 1815 and retained for scientific study. More than a century later, scientists would realize it has properties fundamentally different from nearly all of the thousands of meteorites found on Earth. In 1865, another of these different samples was recovered in Shergotty, India. Both the Chassigny and Shergotty samples would later be used to identify classes of meteorites, the chassignites and shergottites. In 1911, another fundamentally distinct meteorite fell from the sky near Nakhala, Egypt and killed a dog. It too would later become the first of a class of meteorites, the nakhlites.

These three classes, which taken together comprise nine different samples — four shergottites, three nakhlites and two chassignites — have been found around the globe, from Antarctica to Brazil to Nigeria to Lafayette, Indiana. They are distinct because of their age. All meteorites except these nine date back to the early eons of the Solar System, around

4.5 billion years ago. But the so-called SNC meteorites are, incredibly, only about 1.3 billion years old, very young in geologic terms.

When their ages were first determined in the 1960s, the real debate began. They are igneous rocks, which means they formed from a liquid, from molten material. This very quickly indicated volcanic origin of about 1.3 billion years ago, which added to, rather than helped to solve the mystery. By 1.3 billion years ago, the Moon had long since ceased volcanic activity, and none of the asteroids, which are commonly thought to be the source of meteorites, are considered large enough to have sustained internal geothermal activity, although the asteroid Vesta has been suggested as a possibility.

On Mars, however, 1.3 billion years ago was a time when rock was still solidifying from molten material, when it was crystallizing, as geologists put it. Realizing that they had in their possession meteorites of unusual origin, scientists began to suggest the unusual — Mars — as a source.

"In the pre-Apollo 11 days, there was a round of conjecture about what type of material might come from the Moon," said Dr. Donald Bogard of the Planetary and Earth Sciences Division (PESD). "It was suggested that certain types of meteorites might be like lunar material. So conjecture on something coming from the Moon is not new. That of Martian origin, however, is more recent."

Studies of the shergottites added important new evidence in the last three years. All four samples

— one from India, one from Nigeria and two from the Antarctic — were found to have shock ages of 180 million years. Moreover, all the shergottites have cosmic ray exposure ages of 2 million years.

"An interpretation of those ages," said Dr. Laurence Nyquist of PESD, "is that they cooled from molten rock 1.3 billion years ago, where somehow ejected from a parent 'planet' 180 million years

ago as a sizable block larger than two meters across, and that small fragments broke off in space about two million years ago. Those fragments later landed on Earth."

(Continued on page 2)



An example of the possible sources for Antarctic meteorite sample EETA 79001 is illustrated by this photo of the Ceraunius Tholus volcano in the Tharsis region of Mars, taken by one of the Viking orbiters. The large egg-shaped crater at the base of the volcano is indicative of a glancing impact by a high-speed projectile and is also obviously close to a source of igneous rock.

Space News Briefs

Spacelab experiment sims successful

The first simulation of major segments of the Spacelab 1 flight experiments and support subsystems went well recently at the Kennedy Space Center, moving the first mission of the space laboratory a step closer to its scheduled September 1983 launch on STS-9. The Mission Sequence Test was an eight-part trial run designed to verify compatibility of the actual flight experiments with their Spacelab support subsystems. Selected portions of the mission timeline were performed in which several of the experiments were operated simultaneously as they will be on orbit. The Spacelab 1 science crew participated in some of the testing, which was done in the Operations and Checkout Bldg. at KSC.

Voyager 2 in good shape on way to Uranus

Now more than a billion miles from Earth, the Voyager 2 spacecraft has traveled about one tenth of the distance it must cover for its encounter with the planet Uranus in January 1986. After five years in deep space and successful encounters with Jupiter, Saturn and several of their satellites, the instruments on Voyager 2 are functioning well after more than 40,000 hours of operating time. About 148 of the original 230 pounds of propellant remain for attitude control and trajectory correction. The two radioisotope thermoelectric generators are furnishing 422 watts of electrical power, 92 more than required. The two areas of concern for the spacecraft's health are the scan platform actuator which has shown signs of wear and an ailing radio receiver which has reduced tracking capability. Neither problem is expected to seriously affect the mission to Uranus. Mission controllers at the Jet Propulsion Laboratory are in daily contact with Voyager 2 as it monitors the interplanetary environment. One way radio time from the spacecraft to Earth is now more than 90 minutes. Voyager 2 has sufficient velocity to escape the solar system after its Uranus and possible Neptune encounters in the late 1980s. Its heliocentric velocity is now 44,600 miles per hour, making it the second fastest object made by man. Its sister ship, Voyager 1, is traveling slightly faster.

Cargo bay passes white glove tests

Shuttle-induced contamination in the payload bay is at or below promised levels, according to results recently released by the managers of the Induced Environment Contamination Monitor and other equipment which flew on the second, third and fourth Shuttle missions. The monitors recorded levels of such potential contaminants as water, dust and other particles carried aloft by the Shuttle, plus other contaminants that result from normal outgassing of materials in space. The Marshall Space Flight Center study showed that outgassing rates for payload bay surfaces are within limits, and that most particulate matter carried aloft in the cargo bay dissipates after 15 to 17 hours of flight. The data gathered by the equipment did indicate that users of scientific payloads will have to make provisions for such events as water dumps and thruster firings since they momentarily raise the levels of contamination.

COSPAS/SARSAT system saves seven lives

The international search and rescue satellite project, COSPAS/SARSAT, has located four accident sites and saved seven lives in the first month of operation, and the U.S. satellite participating in the program isn't even in space yet. The Soviet Union's COSPAS satellite, launched June 30, has located two downed planes in Canada, one in New Mexico and a capsized catamaran off the coast of New England. The U.S. contribution to the program will be launched aboard a weather satellite, NOAA-E, in February 1983. SARSAT project activities will be managed by the Goddard Space Flight Center. France and Canada are also applying space technology to the program for locating civil aircraft and ships in distress. The satellites are capable of detecting the emergency locator transmitter signals which are activated automatically on almost all types of aircraft after an impact. The system is also capable of detecting other types of distress signals and is able to scan wide areas to identify their source.

Evidence points to Martian origin

(Continued from page 1)

But how did they get here? More perplexing, how did they leave the parent body in the first place? An impact 180 million years ago which broke off a chunk of rock could have happened on several bodies, Nyquist said, but coupled with the crystallization age of the rocks, Mars began to put forward as the most logical source. The first serious suggestion came in 1979, and was immediately considered improbable by dynamicists and others within the planetary science community. How could a block of material escape the gravity of Mars? An impact capable of imparting such velocities would more than likely vaporize rather than propel surface rocks, they said. And even if such a collision could indeed send chunks of rock flying off into space from Mars, then why have we not located similarly propelled objects from the Moon, which is closer?

Nyquist and Bogard, among many others, decided to try and decipher the puzzle. At the Lunar and Planetary Science Conference this spring, Nyquist will present a paper which is the latest answer to the problem of how the chunks might have come from Mars. In it, he draws on past research, coupled with his own, to suggest that a projectile striking a body at an angle of 15 degrees or less (an oblique impact) could, with sufficient velocity, impact and

ricochet, carrying with it pieces of the surface, accelerating them to escape velocity through fluid dynamic drag.

This could answer the questions about the mechanism for rocks leaving the surface of Mars, but then why haven't scientists discovered rocks similarly propelled from the Moon? The lunar crater Messier, after all, is generally considered a classic example of the result of a grazing impact, with ejecta spread around it in a typical "butterfly" pattern.

As it turns out, a sample was recently returned from the Elephant Moraine region of Antarctica which is nearly identical to those returned from lunar highlands by Apollo 15, 16 and 17. Nyquist said the find represents further evidence, but he also believes there is a mechanism to explain the absence of lunar meteorites on Earth, with or without the recent find.

His calculations lead him to believe that the very nature of transit time from Mars to Earth and from the Moon to Earth explains the relative lack of lunar rocks. If an impact sufficient to propel rock into space occurs on either Mars or the Moon only every 100 million years, he says, then Mars to Earth transit time of over 100 million years means there is essentially a steady state influx, a "pipeline," of material from Mars. A rock blasted from the Moon, on the other hand, would be quickly swept up by the

Former JSC Director **Dr. Christopher C. Kraft Jr.** was selected for the Distinguished Public Servant Award by the Houston Chapter of the American Society for Public Administration in conjunction with the National Contract Management Association, Space City — Houston Chapter. The award honored Kraft for his many contributions to the nation's space program. The awards presentation also featured JSC Director of Administration and Programming **Phil Whitbeck** and former astronaut **Alan Shepard**.

Thomas R. Tarla has joined the staff of the Office of Inspector General at JSC as Deputy Director. Prior to the appointment, Tarla was a Special Agent with the Federal Bureau of Investigation. During 1975, he was detailed to the Surveys and Investigations Staff of the U.S. House of Representatives for six months. He also worked as an auditor with Arthur Andersen & Co. from 1968 to 1970. He served in the U.S. Navy from 1961 to 1965.

Capt. Albert V. Chapman III, one of the original 13 officers assigned here by the U.S. Air Force as a flight controller/operations integrations officer, has been named Company Grade Officer of the Year for the Detachment 2 Space Division, Manned Space Flight Support Group. Capt. Chapman supported STS-1 and STS-2 from Mission Control as a Landing Support Officer on the Orbit Team. He has since worked as the Operations Integration Officer during Shuttle missions.

Smoke detectors for the home went to three JSC employees in a drawing held at the fire prevention movies recently. **Daniel Benbenek**, a co-op student working in Bldg. 29; **Dennis Fowler**, a groundskeeper working for Kut-Rite; and **Victor Murray**, a safety engineer for Northrup Services; are the winners. Almost 500 people attended this JSC Safety Awareness Program film presentation.

Outstanding Secretaries for October, November and December have been named at JSC. **Bettye J. Solcher**, Procurement, Administration and Program Support Directorate, was the Outstanding Secretary for October. **Carole K. Boney**, Medical Research Branch,

Earth's much stronger gravitational field, and the lifetime of recognizable meteorites subjected to terran weather conditions is only a few hundred years.

At the same time as Nyquist's research is entering the field, Bogard is wrapping up a paper which makes the evidence for Martian origin of the rocks very persuasive. One of the samples returned from the Antarctic in 1979, also found in the Elephant Moraine region not far from the U.S. McMurdo Base, contained traces of the noble gases similar to those measured on Mars by the Viking landers. Measurements of such gases as helium, argon, xenon and krypton in sample EETA 79001 "don't look like anything so much as the Viking measurements of the Martian atmosphere," Bogard said.

Besides elemental abundances which point to Mars, Bogard's experiments have turned up isotopic signature patterns close to what the Viking landers measured. Argon-40, for example (not the more common argon-38), is anomalously plentiful on Mars, and the argon-40 ratio with helium-4 signatures found in the rock leads to a strong suggestion of Martian origin.

"It is one more line of evidence," Bogard said. But on the side of caution, he added, "Our studies are like fingerprint comparisons. But in the case of Mars,



The past and present merged incongruously recently during the Greater Houston Area Model A Club picnic at JSC, when club members parked their trusty cars near the equally trusty Saturn V. The group also toured Mission Control, on foot, the Visitor Center and the mockups in Bldg. 9A during their visit.

Medical Sciences Division, Space and Life Sciences Directorate, was the November Outstanding Secretary. **Kathleen E. Michels**, Test Division, Program Operations Office, has been named the December Outstanding Secretary. As Secretary to the Director of Procurement, Bettye Solcher provides support to the four professionals in that office. She is also the property custodian, time and attendance clerk, safety representative, Combined Federal Campaign representative and performs other such functions for the office. She also trained a summer aide student to fill the other secretarial position in the office and handles scheduling of the 15 Award Fee Evaluation Boards responsible for

reviewing contractor performance.

As secretary to the Medical Research Branch, Carole Boney "has consistently demonstrated outstanding competence in the performance of her duties," according to Branch Chief Dr. Philip Johnson. She has developed procedures for smooth handling of incoming correspondence and was responsible for the acquisition and implementation of a new word processing system in the Branch. She recently developed data formats and methods for updating documentation supporting medical reports from Shuttle missions and medical requirements necessary for a space station health medical facility.

As lead secretary in the Test Division, Kathleen Michels coordinates with branch chiefs on such items of business as travel, overtime forecasting, training courses and other administrative matters. Two years ago she volunteered for work in the Mission Evaluation Room during Shuttle missions and has maintained performance of her division duties at the same time.

People



Bldg. 2 was littered with walking and hobbling wounded last week in the aftermath of the first semi-annual and somewhat irregular Public Affairs Office Black and Blue Bowl. Above, Jeff Carr (white jersey, center), son of Skylab 4 astronaut Gerald Carr, is about to cream his sister Jamee during her first and last run with the ball.

we have a rather smudged print. There are certain types of information which can only be derived from actually handling a sample, such as mineral chemistry and mineral petrology. Viking measured a fine dust sand, not rocks, to get a chemical composition of the Martian surface. However, there are several elemental abundance patterns and certain isotopic signature patterns which make for a reasonably good argument. When you take the cumulative evidence, it makes for a strong argument of Martian origin."

So far, the caution inherent in scientific detective work prompts researchers here to suggest Martian origin specifically for only sample 79001, a shergottite, for

both geochemical and geological reasons. Nyquist will go so far as to say that the evidence suggests the four shergottites are a coherent group, possibly originating from the same event millions of years ago. Others are saying the evidence gleaned from studies of sample 79001 and the eight additional members of the SNC group could mean all are from Mars.

"The only conclusive thing would be to go to Mars and find out," said PESD Chief Dr. Michael Duke. What is sure is that the detective work and the debates will continue until that day 20 or 30 years hence when either a human or a robot is able to bring a piece of the Red Planet back to Earth where the questions can be answered once and for all.

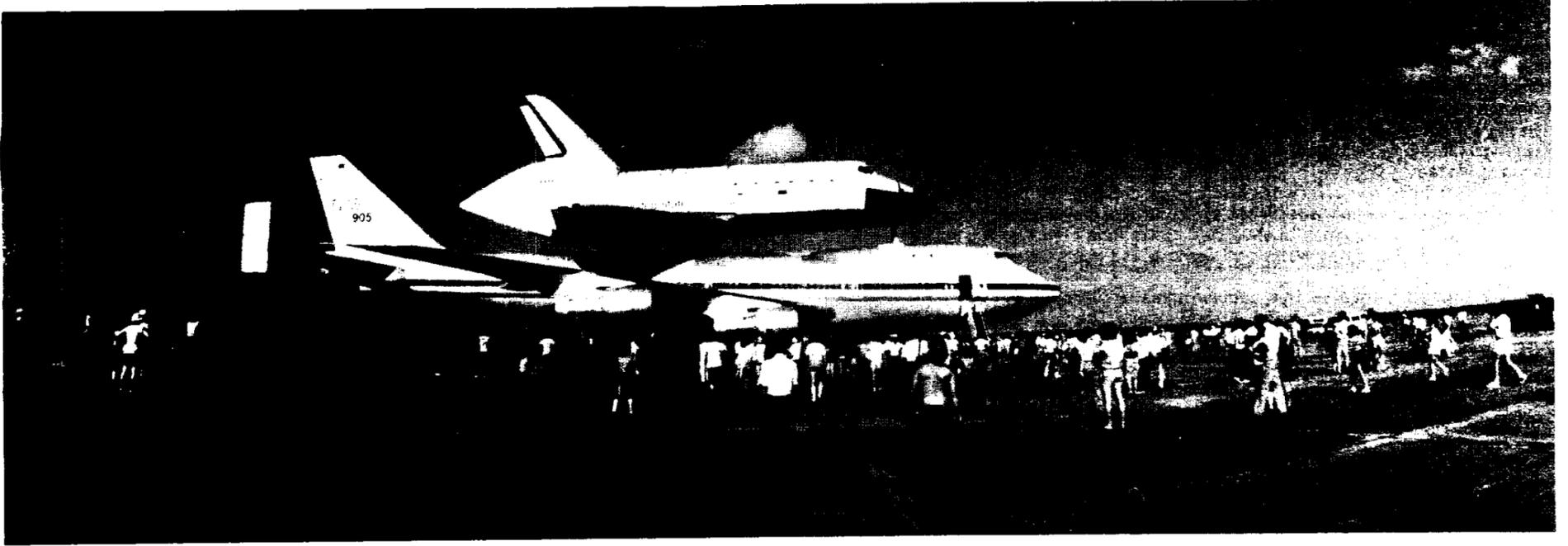
NASA
Lyndon B. Johnson Space Center

Space News Roundup



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Editor: Brian W. ...



1982

The year in pictures



The year saw the arrival of a new Orbiter and a new son for the Gibsons, a record seven-day mission for Jack Lousma and Gordon Fullerton, and the end of the Shuttle pressure suits. T. K. Mattingly and Hank Hartsfield were greeted on the tarmac by the Reagans, and the largest STS crew yet opted for the breakfast of champions before their trip into orbit. JSC got a new Director in Gerald Griffin, and the esteemed Spaceship Columbia was rolled out three times, launched thrice and had several million miles added to the odometer before going into the garage for an overhaul at year's end.



Seasons Greetings

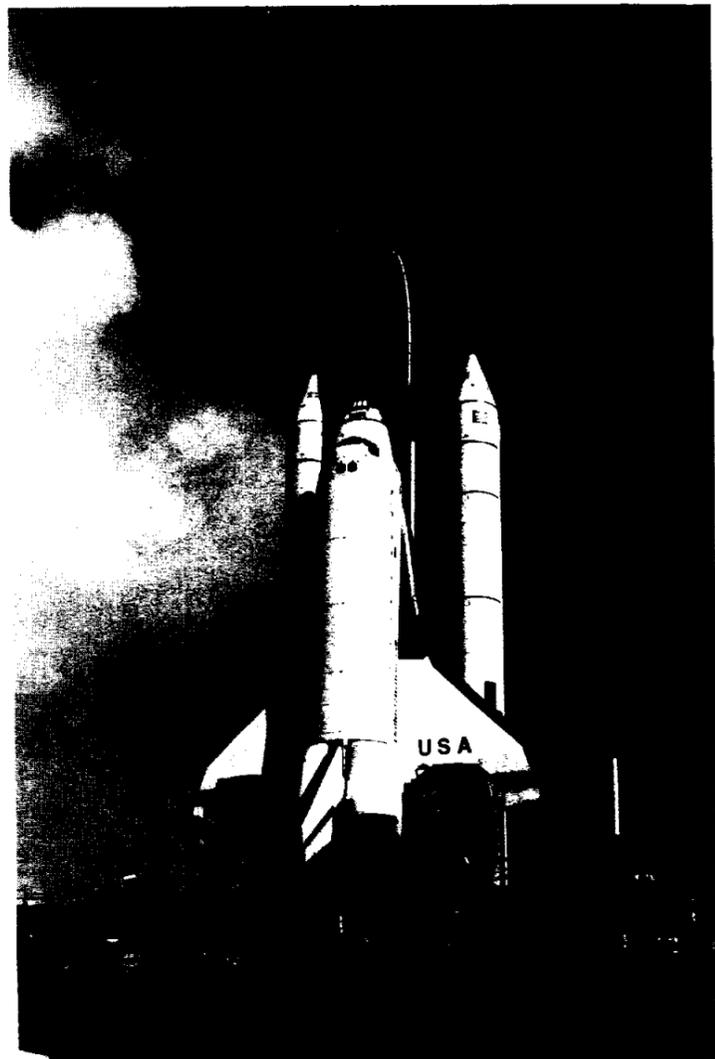
Last year at this time, the Holidays overtook us at the midpoint of our program to test the Space Shuttle system and certify it fit for operations. Now as all of us enjoy another Christmas season, we can view with pride the complete success of that program, as well as the first operational mission in November. In 1982, we delivered!

It is not often that people are fortunate enough to contribute to the making of history, both directly and indirectly, on an almost daily basis. But the JSC community has done it for 21 years and will keep on doing it for the foreseeable future. Ours is a record to be proud of, but many challenges remain.

We must maintain our scientific and developmental expertise, as other projects become necessary in the near future. Now that we have proven the capabilities of the Shuttle system, we must go out and use it to the fullest, and our commitment to quality must remain unabated while we continue to become more efficient in the planning and carrying out of Shuttle missions. Our training programs, our simulations and our participation in missions will begin to rise dramatically in 1983, and our attention to detail must not waver. We have our work cut out for us, but I know that JSC and the other members of the NASA team will rise to the challenges of 1983 and beyond.

Best wishes of the season, and happy holidays to all of you.

Gerald D. Griffin



Gilruth Center News

Call x3594 for more information

Defensive driving — Learn to drive safely and qualify for a 10% reduction in your auto insurance rates for the next three years. Class meets from 8 a.m. to 5 p.m. Saturday, Jan. 22. The cost is \$20 per person and space is limited.

Yoga — Start the new year off with classic yoga, designed for those who desire to gain inner peace, awareness and control of their bodies. Yoga promotes health and a sense of aliveness. Class runs from 7 to 8 p.m. beginning Jan. 4. The class meets on Tuesdays and costs \$20 per person.

Country western dance — This popular class is available beginning Jan. 10, and runs from 7:15 to 8:45 p.m. on Mondays. The cost is \$20 per couple, limit 15 couples, first come, first serve.

Ballroom dance — Learn the fine art of ballroom dance in this class, which meets beginning Jan. 6 on Thursdays for eight weeks. Two classes will be offered. The intermediate class meets from 7 to 8:15 p.m., while the beginners meet from 8:15 to 9:30 p.m. The cost is \$50 per couple.

Dancercise — Part dance, part exercise, all fun, this class will gradually get you into shape. The six-week course begins Jan. 4 and runs on Tuesdays and Thursdays from 5:30 to 6:30 p.m. The cost is \$20 per person.

Children's movie — The next movie will be the "Looney, Looney, Looney Bugs Bunny Movie," to be shown from 10 a.m. to noon Jan. 22. The cost of \$1 per person covers popcorn and soft drinks. Tickets are on sale at the Bldg. 11 Cafeteria.

Aerobic dance — Dance away those extra inches with Jacki Sorensen's dance class, which meets Mondays and Wednesdays from 9 to 10 a.m. and Tuesdays and Thursdays from 4:15 to 5:15 p.m. The cost for this 12-week course is \$60 per person.

Square dance — By popular demand, the Rec Center is again offering this class on Thursday nights beginning Jan. 6. The class will meet from 7:15 to 9:15 p.m. for eight weeks. Cost of the course is \$25 for couples or \$12.50 for singles. Participants should know the basics for this class.

Ladies weight training — This popular class begins Jan. 3 and runs for six weeks. Class meets Mondays and Wednesdays from 7 to 8 p.m. at a cost of \$20 per person.

Principles of decorating — This class is designed to help you think about how to decorate your home. Basic patterns and ideas will be taught, as well as ways in which to accomplish the decorations. The class begins Jan. 6 and runs for eight weeks. Cost for this Thursday night class is \$30 per person. The sessions run from 7 to 8 p.m.

Winter league activities Registration is now open for the winter season's mix of activities, such as men's, women's and mixed softball and league basketball. A mixed recreational volleyball league will also be offered. Deadline for entries is Jan. 3 at 5 p.m. The new season will begin in the first few weeks of January.



It's not a reindeer, but this JSC resident is as close as we come in Texas. The buck was photographed during an early-morning tour of the Center recently by PAO photographer Andrew Patnesky between Bldg. 4 and Bldg. 12.

Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP3 Roundup, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

Property & Rentals

For sale: 2-1-1 condo in Dickinson, assume w/\$4,000 equity and \$245.95 monthly payment, quiet residential area. Call Tam, x4949 or 534-3376.

For sale: University Green townhouse, 3-2.5-2, fireplace, patio, by owner. Call 488-8682 after 5 p.m.

For rent: Lake Tahoe condo, near ski lift and casinos, completely furnished, sleeps six, available Jan. 24-31 and Feb. 21-28, \$500/wk. Call 488-8682 after 5 p.m.

Co-op special: furnished bedroom in private home, \$155/mo. plus options, utilities paid, available Jan. 3. Call Jim, x5071 or 480-5097 after 5 p.m.

For sale: Two or three BR condo, view of bay, 2 bath, owner finance, low down. Call 474-7713.

For rent: Galveston By-The-Sea condo, 2 BR, furnished apartment for rent by days (2 minimum) weeks or month. Call Clements, 474-2622.

For sale: 52 acres in hill country near Fredericksburg, well, creek, mobile home, fenced, 1/2 timber, deer. Call Haines, x3851.

For sale: Lake Livingston area, 2 BR house on 30 acres, deep well, wooded, fenced, live creek, \$95K. Call 488-4915.

For sale: Middlebrook, 4-2-2, formals, paneled den, bookcases and fireplace, energy efficient, low equity, 9.5% VA loan, 2,150 sq. ft. Call Wheeler, x5276 or 486-5346.

Cars & Trucks

1980 Fiat X-19, silver, AM/FM stereo, extras, 27K miles, excellent condition, assume \$210/mo. payments for approx. 28 months. Call Shannon, x4831 or 996-9038.

1976 Celica GT liftback, AM/FM/Cassette stereo, AC, 5 spd., \$2,850. Call Jackie, x5639 or 996-0254 after 6 p.m.

1971 Chevy Monte Carolo, PS, PB, some rust, good tires, dependable work car, \$600. Call Vic, x6154 or 482-4120 after 6 p.m.

1975 Chevy Impala, 9 passenger wagon, AC, PS, PB, AM/FM, auto, sun roof, cruise, some rust, \$650. Call Dave Dunn, 486-0808.

1980 Monza, power, AC, AM/FM/Cassette, call & leave message, 388-2233.

1979 Chevy Monte Carlo, V-6, AC, PS, PB, AM/FM/cassette stereo, excellent condition, \$4,000. Call Fil, x3188 or 480-6109.

1975 Cutlass Salon, loaded, excellent condition, very good tires, one owner, \$1,750. Call John, x4204.

For sale: 1981 Toyota pickup, 4WD, SR5 Sport, AM/FM stereo, AC, 5 spd. overdrive, 28K miles, excellent condition, must sell, \$7,400. Call Sue, x4678

Boats & Planes

19-foot Texas trimaran sailboat, nearly new, sails by John Kolius, fast but safe, can't tip over, seats six, tilt trailer, \$2,750. Call 649-6601.

Piper Lance for rent, AC, club seating, \$75/hr. wet. Call L. Damewood, 482-5572.

P35 Bonanza 1/4 interest, based at La Porte, full IFR w/1982 avionics and flight director auto pilot, \$3,500 equity plus note. Call Bill Pruett, x4491 or 487-3857 after 5 p.m.

FAA pilot ground school, \$10 through Gulf Coast Aero Club, \$8/mo. dues. Call Mark, x4436 or 554-2538.

Cycles

1980 Yamaha IT 175, very low miles, excellent condition, \$750 or best offer. Call Bob, x6226 or 488-3314 after 5 p.m.

Girls 20 inch Schwinn, hand brakes, wicker basket, \$15. Call Tony Riggan, x2241 or 471-3025.

Girls 20 inch Schwinn bike, excellent condition, \$50. Call 488-8678 evenings.

Woman's 24 inch 10-speed bike, excellent condition, \$75. Call Pat, x5031 or Elrae, 474-3405 after 4:30 p.m.

1973 Honda CB450 with fairing, 14K miles, \$450. Call Earl, 334-2294.

Household

Couch and chair, brown and beige, \$75 or best offer. Call Gibson, 280-0774.

Penny's microwave/TV cart, \$30; stereo table, \$20; kitchen table, \$35. Call Gary, x2156 or 482-1290.

Kenmore refrig./freezer, 19.1 cu. ft., \$350; Sears large capacity washer, \$300; garden and lawn tools, bar stools, treadle sewing machine, work bench. Call Keith, x3643 or 332-8251.

Bunk bed, excellent condition, sturdy, \$75. Call Fay, 488-3497 after 5 p.m.

Vacuum cleaner with all attachments, excellent condition, \$75. Call 482-7546.

Recliner, avocado vinyl, top quality construction, good condition, \$80. Call Cookie, x2228 or 474-5610 after 5 p.m.

Heavy gauge wrought iron table, round, glass top, four chairs, \$15; authentic ships hatch cover table,

needs reglassing, \$35. Call 488-8682 after 5 p.m.

Broyhill sofa and loveseat, light green print, 2 Broyhill octagon tables and coffee table, \$500 or best offer. Call Jean, x2071 or 480-6924 after 5 p.m.

Sofa, 96" long, good condition, \$50; twin bed, \$75; RCA floor TV, \$40. Call Birdie, 944-0493.

Early American sleeper sofa, queen size, excellent condition, best offer. Call Shannon, x4831 or 996-9038.

Pets

Free white German shepherd, wormed and has rabies shot, 6 months old. Call 946-8204 anytime.

Free kittens for Christmas. Call 337-1160.

Free puppies, Gordon setter mix. Call 480-7413 after 5 p.m.

Wanted

Want to join carpool from Uvalde Rd. to NASA, 7:30 to 4 p.m. shift. Call Doug Hamdon, x4949 or 459-2829.

Want cage for cockatiel or large bird cage. Call Marlow, 482-5573 after 5 p.m.

Need to join carpool from I-45/W.

Mt. Houston area to JSC. Call Lisa, x2033.

Want to buy sewing machine table, two bicycles, 3- or 10-speed, for adults. Call 996-9070 after 5 p.m.

Miscellaneous

Flamenco guitar, Spanish pine top, Med. cyprus sides and back, \$300. Call Mike, 486-5020 after 5 p.m.

Atari 2600 video game plus 11 game cartridges, including Indy 500 controls, excellent condition, \$208. Call 480-4688.

Canon 1014 Super 8 movie camera, 10:1 auto zoom 1.4 lens, fade in/out, auto exposure, slo-mo, time exposures, \$450. Call Ray, x6186.

New Radio Shack direct-connect, 300 baud modem, lists for \$149, sell for \$100. Call Phillips, x3431 or 480-7239.

Small 10-30X zoom telescope, \$25; numerous astronomy manuals and texts, National Geographics with aviation/space/astronomy topics. Call Gary, x2156 or 482-1290.

One half HP, 100 psi, tank type air compressor, with 20' hose, new, \$125; Rockwell bench sander/grinder, new, \$75. Call Gary, x2156 or 482-1290.

Fresh honey, \$10/gal. and pecans, \$1.50/lb. Call Clarence Blume, x5159 or 554-2911.

Radio-controlled airplanes, radios, engines and other RC accessories. Call Chuck, 487-2978 after 5 p.m. and weekends.

Four 15 X 7 western turbine mags with hugs and lugs, \$90; new Plymouth Arrow hood, \$50. Call 944-3105.

Adjustable wonder riding horse (Best catalog, p. 454), like new, \$30. Call 488-3377 after 5 p.m.

Delco AM/FM car stereo, virtually new, w/clock, fader, balance and tone controls, \$100. Call Mark, x6226 or 480-1008.

Pocher 1935 Mercedes Benz model kit for sale for original price of kit, chassis completed, exact 1/8 reproduction of car. Call Frank, x3161 or 482-9518 after 5 p.m.

Bluebonnet Bowl tickets, two 50-yard line gold box with reserved parking, \$38. Call Jim McBride, x6226 or 337-4643.

Complete seat assembly from 1981 Toyota pickup, will fit others, tan, like new, \$125. Call Underhill, x2138 or 334-1303 after 4 p.m.

Cookin' in the Cafeteria

Week of December 20-24, 1982

Monday: Beef & Barley Soup; Beef Chop Suey, Breaded Veal Cutlet w/Cream Gravy, Grilled Ham Steak, Weiners 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, Christmas Special: Baked Turkey w/Combread Dressing served with Giblet Gravy, Cranberry Sauce, Candied Yams, Green Beans Almondine, Ambrosia Salad, Roll, Butter and Beverage.

Wednesday: Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised Beef Ribs, Mexican Dinner (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: Holiday

December 27 - 31, 1982

Monday: French Onion Soup; BBQ Sliced Beef, Parmesan Steak, Spare Rib w/Kraut, Chili & Macaroni (Special); Ranch Style Beans, English Peas, Mustard Greens. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday: Split Pea Soup; Meatballs & Spaghetti, Liver & Onions, Baked Ham w/Sauce, Corned Beef Hash (Special); Buttered Cabbage, Cream Style Corn, Whipped Potatoes.

Wednesday: Seafood Gumbo; Cheese Enchiladas, Roast Pork w/Dressing, BBQ Link (Special); Pinto Beans, Spanish Rice, Turnip Greens.

Thursday: Beef & Barley Soup; Roast Beef w/Dressing, Fried Perch, Lasagne w/Meat, Chopped Sirloin, Chicken Fried Steak (Special); Whipped Potatoes, Peas & Carrots, Buttered Squash.

Friday: Holiday

January 3 - 7, 1983

Monday: Cream of Potato Soup; Franks & Sauerkraut, Stuffed Pork Chop, Potato Baked Chicken, Meat Sauce & Spaghetti (Special); French Beans, Buttered Squash, Buttered Beans. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Section of Salads, Sandwiches and Pies.

Tuesday: Navy Bean Soup; Beef Stew, Liver & Onions, Shrimp Creole, Smothered Steak w/Dressing (Special); Corn, Rice, Cabbage, Peas.

Wednesday: Seafood Gumbo; Roast Beef, Baked Perch, Chicken Pan Pie, Salmon Croquette (Special); Mustard Greens, Italian Green Beans, Sliced Beets.

Thursday: Beef & Barley Soup; Beef Tacos, Diced Ham w/Lima Beans, Stuffed Cabbage (Special); Ranch Style Beans, Brussels Sprouts, Cream Style Corn.

Friday: Seafood Gumbo; Fried Shrimp, Deviled Crabs, Ham Steak, Salisbury Steak (Special); Buttered Carrots, Green Beans, June Peas.