MARSHALL STAR

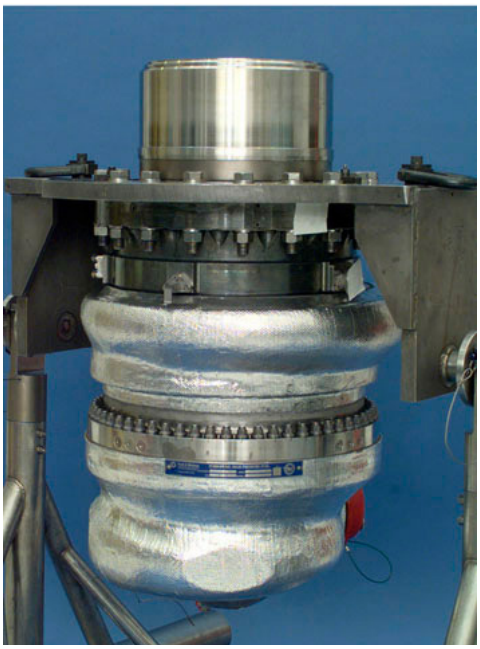
Marshall Space Flight Center July 19, 2001

First launch is 'smooth' for Marshall Center's new Space Shuttle Block II Main Engine

by Lynnette Madison

It was a "smooth" launch last Thursday for the new Block II Main Engine, which helped lift Space Shuttle Atlantis into orbit at 4:04 a.m. CDT.

The initial look at the data indicates the launch was smooth and the new engine performed as expected, said George Hopson, manager of the Space Shuttle Main Engine Project Office at the Marshall Center.



Block II Main Engine

Atlantis used one Block II Main Engine and two Block IIA engines to complete its full complement of three engines.

"The launch of STS-104 was a major milestone for Space Shuttle propulsion," said Art Stephenson, director of the Marshall Center. "The new engine provides the Shuttle crew with an even safer ride into orbit. It is one of the many initiatives we are undertaking to improve what is already the safest, most reliable space transportation system in the world."

Post-Launch, Quick-Look Assessment

- **Engine performed as predicted and all pre-launch conditions and boost phase operations were normal**
- **Observations on coolant liner pressure and turbine discharge temperatures were on target**
- **Data indicates good starts on all three engines**
- **Vibration levels were normal and consistent with testing history**
- **Block II turbopump exhibited comparable trends and levels to acceptance test**

The Block II Space Shuttle Main Engine includes a new high-pressure fuel turbopump developed by Pratt & Whitney of West Palm Beach, Fla. The new design eliminates welds by using a casting process for the housing and includes a heavy integral shaft/disk with robust bearings. This makes the pump stronger and should increase the number of flights between major overhauls.

The writer, employed by ASRI, supports the Media Relations Department.

Students' hands-on biology experiment bound for Space Station

by Tracy McMahan

Students and teachers from elementary, middle and high schools in Alabama, California and Tennessee have prepared biological samples for an experiment astronauts are placing aboard the International Space Station this week while the Space Shuttle Atlantis visits that unique, orbiting laboratory.

Working side-by-side with university and NASA scientists, the students mixed and loaded about 100 of the 500 biological samples in small plastic tubes that were then frozen and placed in an experiment container.

The crew will transfer the experiment from the Shuttle to the Space Station during the STS-104 mission.

"We are pleased to give the scientists and engineers of the future a hands-on role in biotechnology experiments on the Space Station," said Ron Porter, manager of the

*See **Experiment** on page 7*

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Photo by Dennis Olive, NASA/Marshall Space Flight Center

Looking toward SPASE

Marshall Center Director Art Stephenson, right, recently visited the University of Alabama in Huntsville (UAH) to view the Small Payload Access to Space Experiment (SPASE) satellite. SPASE, a free-flying satellite, was undergoing testing with its ground control station located at UAH. The SPASE project — expected to launch on STS-108 in November — is designed to demonstrate a low-cost, small-payload support system for university-class payloads. The support system will provide communication, command and data management, and power management for small payloads, allowing the payloads to focus on science. AeroAstro is the lead contractor on the SPASE project for the Marshall Center.

NASA realigns HQ organizational structure

Office of Management and Budget Director Mitchell E. Daniels Jr., in his May 8, 2001, Bulletin, provided instructions for responding to the President's initiative for agencies to restructure their workforces to streamline organizations.

Using this guide, we have assessed the Headquarters structure and decided our course. We will realign Headquarters functions to answer the Administration's challenge to compress the supervisory hierarchy and redistribute those resources to front line positions, to strengthen management oversight and to improve the coordination of our efforts and activities. We believe these actions will support the President's initiative.

We will begin the realignment of NASA Headquarters by assigning reporting configurations to improve the coordination of activities, communication, consultation and decision-making. Direct interaction between me and the officials-in-charge shall continue, but will now include a principal senior official whose direct management oversight will strengthen and add value to these exchanges and the decisions that flow from them.

The Enterprises (and through them, their respective Centers), Codes AE, AM, AS and Code Q will report to me through the associate deputy administrator. Codes B, G, I, L and P will report to me through the chief of staff. Finally, Codes AO, C, E, F, H, J, K and X will report to me through the new position of associate deputy administrator for institutions. Chris Christensen has agreed to fill this critical Agency position in addition to maintaining his leadership role in Headquarters Operations.

There are three other key features to the Headquarters

Special Notice from the Administrator

realignment. This initiative will redistribute Code Z functions to other offices at Headquarters. At the same time, we will determine which leadership assignments should be redistributed to positions that directly serve internal and external customers and stakeholders, and act on those decisions.

A third element of the realignment has already begun. We have identified executives whose careers will be refreshed by new assignments within Headquarters or at the Centers, and we have discussed the redistribution plans with them.

I have asked Dan Mulville, Courtney Stadd and Chris Christensen to define the actions necessary to ensure the success of these changes. They shall guide the measures I have approved to strengthen the decision-making process at Headquarters, to enhance effective performance and accountability, and to realign the organization. Dan, Courtney and Chris will work with you to define the optimal strategies, options, ground rules and timelines for implementing these actions.

The realignment of Headquarters functions and concomitant actions to implement changes to the organization require your executive leadership, innovation and enthusiastic support and commitment, to ensure complete success. I look forward to steady progress in this endeavor.

Dan Goldin,
NASA Administrator

Stennis completes first hot-fire test of aerospike engine technology for Space Launch Initiative

Stennis release

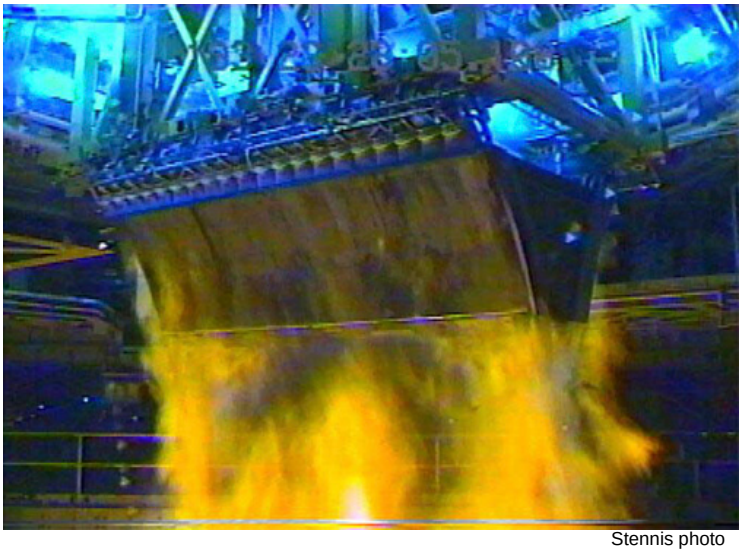
Stennis Space Center, Miss., has successfully completed a critical initial test in a three-part series for a Space Launch Initiative (SLI) test program of the Electro-Mechanical Actuator (EMA) technology used on the former X-33 program's Linear Aerospike XRS-2200 flight engine set. The July 12 test was a "start-sequence" test and went the full scheduled duration of 5.32 seconds.

The test was a unique opportunity for NASA to effectively gain valuable experience and data from existing commercial technology.

EMAs electronically regulate the amount of propellant (fuel and oxidizer) flow in the engine. The technology is a potential alternative and improvement to the older hydraulic-fluid systems currently used by the aerospace industry to drive and control critical rocket engine valves.

According to NASA's Garry Lyles, Space Launch Initiative Propulsion Program Office manager at the Marshall Center, the EMA technology is of interest to SLI because all engine concepts being considered for the program use EMAs.

"SLI's primary focus is on technology development for concepts that would be able to dramatically reduce cost and improve safety and reliability of launching payloads for NASA, commercial and military missions," Lyles said. "Since the engine was already in a test stand at Stennis, taking advantage of the dual aerospike flight engine set already in the A-1 test stand was too great of an opportunity to pass up."



Stennis photo

July 12 aerospike engine test

According to NASA's Dr. Don Chenevert, EMA project manager at Stennis, the initial test will be followed with a 25-second test at 80 percent power level. The third test is scheduled for 100 seconds and will demonstrate relevant engine operations and show how the EMA control system works under actual thermal, hydraulic and stress loads.

Photo by Emmett Given, NASA/Marshall Space Flight Center

CFC contributions

Marshall's workforce contributed $504,590.02 during the 2000 Tennessee Valley Combined Federal Campaign (CFC). Representatives from CFC and United Way recently received a commemorative check for money pledged. From left are Roslin Hicks, Marshall Center's 2000 CFC chairwoman; Gay Money, 2001 Tennessee Valley CFC director; Melinda Siegler, director of 2000 Tennessee Valley CFC; John Hawkins, president and chief executive officer of the United Way of Madison County; Debbie Gonzalez, 2001 Marshall CFC chairwoman; Tereasa Washington, Marshall Customer and Employee Relations Directorate director; and Marshall Center Director Art Stephenson. The 2001 Combined Federal Campaign begins Oct. 8.

Space Launch Initiative holds technology workshop

Important step to sharing information on second generation RLV technology

The Second Generation Reusable Launch Vehicle Program, also known as the Space Launch Initiative, held the program's first technology workshop this week, with hundreds of NASA personnel and contractor partners gathering at the Huntsville Marriott hotel. The workshop was an important step to sharing information about technology needed for a second generation reusable launch vehicle (RLV).

The first contracts in the Second Generation RLV program were awarded in May to 22 companies and universities. This workshop is the first in a series of government and business meetings to help identify the RLV technology gaps and broaden the knowledge base of the Space Transportation technology community. Those goals primarily are to increase safety and reliability to enable bringing costs down.

Presentations made during the workshop focused on advancing technology efforts in propulsion, flight mechanics, subsystems, operations, vehicle health management, airframes, flight demonstrations, and systems unique to crewed systems.

Courtney Stadd, NASA chief of staff and White House liaison, gave the keynote address at a welcome dinner Monday evening. Stadd served as a NASA transition team member, working with NASA Administrator Dan Goldin and senior officials to prepare the incoming Bush-Cheney Administration for the issues and challenges associated with NASA.

All NASA's field centers are actively participating in the Space Launch Initiative and are vital to its success. The Marshall Center is NASA's lead center for the Space Launch Initiative.

News about the Space Launch Initiative is available at:
http://www.slinews.com

Photo by Terry Leibold, NASA/Marshall Space Flight Center

Dennis E. Smith, manager of the Second Generation Reusable Launch Vehicle Program, welcomes several hundred participants to the program's first technology workshop, held this week at the Huntsville Marriott.

Photo by Emmett Given, NASA/Marshall Space Flight Center

Courtney Stadd, NASA chief of staff and White House liaison, discusses the Space Launch Initiative at a dinner Monday at the Huntsville Marriott for participants of the Second Generation Reusable Launch Vehicle Program technology workshop.

NASA selects proposals to study Earth's environment

NASA release

What element do some researchers jokingly call the "triple whammy" or the "complete trifecta"? It's carbon — not only the very basis of life, but also the principal source of fossil fuel energy supporting the economy and a key factor in controlling global climate.

NASA will learn much more about the global carbon cycle through 80 research grants valued at approximately $50 million over the next three years that will look at everything from forest health in the United States to the role oceans play as the planet's "air filters."

Carbon-containing molecules are a key factor in global warming — carbon dioxide and methane are the two most important "greenhouse gases" that can affect temperatures around the world. Combustion of fossil fuels, use of land for agriculture or industry, and human interaction with the environment all play a part in how Earth's climate "behaves."

Through these awards, researchers will take advantage of the unique vantage point of space and space age technology to look at the planet and how the global climate works.

"These proposals represent the leading edge of research on the carbon cycle and how it affects our climate. NASA is committed to providing sound science to government and industry leaders upon which decisions about human stewardship of the Earth can be made," said Dr. Ghassem Asrar, associate administrator for Earth science at NASA Headquarters in Washington, D.C.

"We know that about half of the carbon dioxide released by humans is absorbed by Earth's oceans and lands. These investigations will help scientists and policy-makers better understand if this will be true in the decades to come," Asrar said.

"A solid understanding of how carbon cycles act among land, atmosphere and oceans will provide a vital key to reliable projections of carbon levels of the future, and hence a better understanding of what role humans are playing in Earth's climate system. Combined with advances in computational-modeling capabilities, and in teaming with other government agencies and international partners, NASA will advance short-term and seasonal weather forecasting capabilities and create an accurate projection of longer-term climate change around the globe. This research also will benefit our short-term weather and seasonal-prediction capabilities," Asrar said.

The grants will go to researchers at universities, government laboratories and other organizations and will investigate virtually all aspects of the carbon cycle. Scientists will use everything from advanced computers, satellites and lasers to aircraft and other conventional tools to carry out these studies. Applications scientists will extend the benefits of this research to a variety of end users. NASA received 288 proposals in response to the research announcement made in 2000.

A complete listing of the research projects and their principal investigators can be found on the Internet at: *http://research.hq.nasa.gov/*

Safety Bowl 2001

The 2001 Marshall Safety Bowl is fast approaching. This week's questions will test your knowledge of safety. For more questions, check "Inside Marshall."

1. An effective safety program will provide for the investigation of mishaps and close call incidents. Why?
2. The _____ Protocol is the international agreement to reduce ozone-destroying chemicals. Fill in the blank.
   A. Kyoto
   B. Washington
   C. Moscow
   D. Montreal
3. If you find yourself or your clothing on fire, what three things should you do before seeking help?
4. True or False: Winds in a tornado rated as F5 are above 260 miles per hour.
5. When are employees permitted to participate in mishap and close-call investigations?
   A. Sometimes
   B. When 10 percent or more of the Marshall workforce is affected
   C. When it's a lost-time or loss-producing mishap
   D. Always
6. True or False: "Tornado watch" means that a tornado has been sighted in your area.
7. How many electrical power strips can be piggybacked without violating Marshall regulations?
8. In a vehicle equipped with an airbag, how much distance should there be between the driver's chest and the center of the steering wheel to avoid injury caused by airbag inflation?
9. Who should clean areas or items contaminated with someone else's blood?
10. Appropriate planning, training/drills, evacuation procedures, response equipment, and natural disaster emergency response plans are all part of what?

*See **Answers** on page 9*

Job Opportunities

CPP-01-057-CL, AST, Aerospace Flight Systems, GS-861-14, Flight Projects Directorate, Flight Systems Department, Nodes 2/3 Program Group. Closes July 24.

Reassignment Bulletin, 01-010-DS, AST, Technical Engineering Operations Management, GS-801-13, Engineering Directorate, Engineering Systems Department, Configuration and Data Management Group. Closes July 30.

Reassignment Bulletin 01-009-CL, AST, Aerospace Flight Systems, GS-861-14, Flight Projects Directorate, Flight Systems Department, ECLSS Group. Closes July 31.

Space Transportation Day

Marshall representatives brief Congress on projects

Marshall's 2nd Generation Reusable Launch Vehicle Program Office and Space Transportation Directorate recently sponsored the second Space Transportation Day on the Hill.

Representatives from both organizations traveled to Washington, D.C., to brief U.S. House and Senate members and staff on the status of the Space Launch Initiative, Shuttle upgrades, and Advanced Space Transportation Program.

Space Transportation Day on the Hill is a unique chance to interact directly with America's leaders. It is an annual event sponsored by the Space Transportation Directorate and 2nd Generation Reusable Launch Vehicle Program Office.

NASA Administrator Dan Goldin gives an overview.

Photos by Emmett Given, NASA/Marshall Space Flight Center

Steve Cook, deputy manager of the Advanced Space Transportation Program, discusses 3rd generation and in-space research and technology.

Tereasa Washington, left, director of Marshall's Customer and Employee Relations Directorate, describes Marshall's support for SLI.

Marshall Center Director Art Stephenson answers questions from congressional representatives about the Integrated Space Transportation Plan.

Dennis Smith, left, manager of Marshall's 2nd Generation Reusable Launch Vehicle Program Office, chats with congressional staffers.

Continued from page 1

Biotechnology Program at the Marshall Center. Marshall is NASA's lead center for flying payloads that take advantage of the low-gravity environment created as the Space Station orbits Earth.

This is the third trip to the Space Station for the experiment, called the Enhanced Gaseous Nitrogen Dewar — a vacuum-jacketed container, similar to a large thermos bottle that stores the samples. Since the hands-on educational project began in 1999, students and teachers from more than 500 schools in states across the country have attended workshops where they grew crystals and learned about biological substances that carry out many important functions for humans, animals and plants.

The students and teachers mix biological solutions and seal the chemicals in small tubes or capillaries. The samples were frozen to -321 degrees Fahrenheit (-196 degrees Celsius or 77.3 degrees Kelvin).

Just before the Shuttle launched, scientists placed the samples in a dewar that has an absorbent inner liner saturated with liquid nitrogen. While Atlantis is docked with the Station, the crew will move the dewar to the Space Station. After about 10 days, when the nitrogen has completely boiled off and thawing is complete, the biological solutions will form crystals.

When the Space Shuttle Discovery visits the Station in August, the dewar will be brought back to Earth, where scientists will retrieve and analyze the crystals to determine the structure of biological molecules.

The students can view photos of the crystals grown during NASA workshops on a special Web site designed by Dr. Anna Holmes, a NASA scientist who helps conduct the workshops at the University of Alabama in Huntsville.

The students can also monitor results as Dr. Alex McPherson — a biochemist at the University of California at Irvine and the lead scientist for the experiment — analyzes other crystals grown aboard the same flight. Right now, McPherson and other scientists are analyzing crystals grown on the Station in the fall of 2000 and spring of 2001.

Marshall photo

Katheryn Koenemann, a student at Central West High School in Tuscaloosa, Ala., pipes a solution into a small plastic tube that will be sealed and frozen.

'We are pleased to give the scientists and engineers of the future a hands-on role in biotechnology experiments on the Space Station,' said Ron Porter, manager of the Biotechnology Program at the Marshall Center.

Often, higher quality crystals can be grown in the low-gravity environment created as the Space Station circles Earth. Scientists use the crystals to map the structure of macromolecules — the building blocks that make up proteins, viruses and other substances that perform critical functions in our bodies and in animals and plants. Knowledge of the precise three-dimensional molecular structure is an important tool for biochemists designing medicines.

This pilot education program has been supported by the NASA Headquarters Education Office in Washington, D.C.; Marshall Center Biotechnology Program; University of California at Irvine; University of Alabama in Huntsville; Alabama A&M University in Huntsville; Alabama Space Grant Consortium; Florida Space Grant Consortium; Texas Space Grant Consortium; Bell South Pioneers in Tennessee; Alabama Science in Motion, a division of the Alabama Department of Education; and many other corporate and institutional sponsors.

The Microgravity Research Program Office at the Marshall Center and the Office of Biological and Physical Research at NASA Headquarters in Washington, D.C. sponsor the Enhanced Gaseous Nitrogen Dewar experiment and the student experiment program.

The writer, employed by ASRI, supports the Media Relations Department.

Lyme disease: Don't let a tick make you sick

from Marshall's Safety Office

Lyme disease affected more than 16,000 people in 1998. The areas in the United States with the highest risk for Lyme disease are in the Northeast region, from Massachusetts to Maryland, the North Central region, including Wisconsin and Minnesota, and an area of northern California's Pacific Coastal region.

People who work in construction, landscaping, forestry or any occupation that takes them into heavily wooded or grassy areas are at increased risk of exposure to the ticks that carry Lyme disease.

To help reduce the risk of Lyme disease to outdoor workers, OSHA recently issued a Hazard Information Bulletin that advises employers on implementing an effective Lyme disease prevention program.

The Hazard Information Bulletin follows the recommendations of the Centers for Disease Control and Prevention. Some of the steps recommended to reduce the risk of Lyme disease are:

- Avoid tick habitats whenever possible
- Wear clothing that keeps ticks from reaching the skin
- Use insect repellants
- Consider using a protective vaccine

The OSHA bulletin and a Lyme disease fact sheet can be found on OSHA's Web site at: *http://www.osha.gov*.

NASA celebrates 25th anniversary of Mars landing

Twenty-five years ago, on July 20, 1976, NASA's Viking 1 lander soft-landed on the surface of Mars, becoming the first successful mission to land on the Red Planet, as well as the first successful American landing on another planet.

With a second lander later joining the first on the surface and with two orbiters circling the planet, the Viking project changed our understanding of that alien world. Its treasure trove of images and data covering the entire Martian globe remains a valuable scientific resource for the study of Mars.

The Viking 1 lander operated on the Plain of Chryse (Chryse Planitia) until November 1982. The Viking 2 lander set down on the Plain of Utopia (Utopia Planitia) on Sept. 3, 1976, and operated until April 1980. The two landers took 4,500 unprecedented images of the surrounding surface and more than three million weather-related measurements, while the two orbiters took 52,000 images representing 97 percent of the Martian globe.

Viking will probably be most remembered for its search for life on Mars. Each lander contained a suite of biology instruments designed to detect evidence of life in the Martian soil. Scientists concluded that the Viking experiments found no evidence of life at either landing site, but didn't rule out the possibility that life may have existed in the past or may still exist in other, more hospitable, places.

Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Testing Shuttle components

David Wood, right, explains the test procedures being conducted on the regulators and valves in the Component Development Area to Parker Counts, left, manager of the Solid Rocket Booster Project Office. Jim Richard, a component developer in the Mechanical Design Group and test conductor for this test series, looks on.

Lunar Roving Vehicle marks 30th anniversary

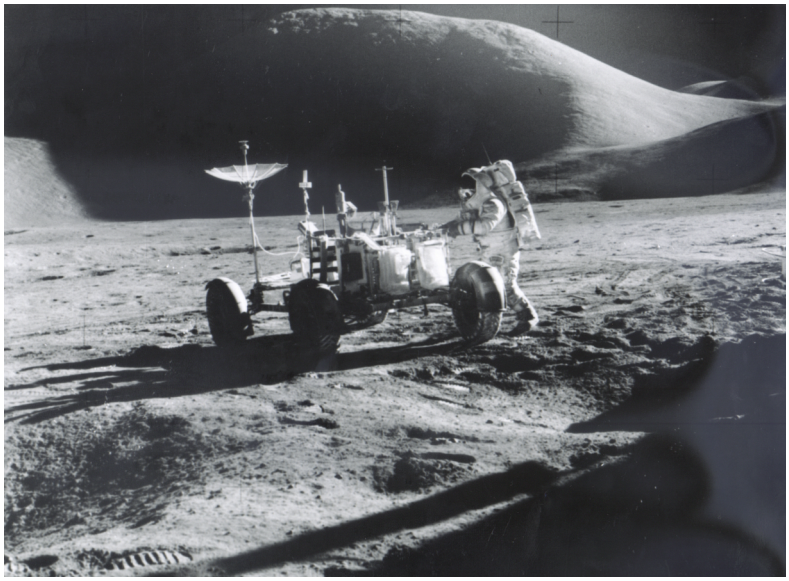
from Marshall's History Office

Almost 30 years have passed since Apollo 15 was launched July 26, 1971, carrying three astronauts and the first lunar roving vehicle to the surface of the Moon.

The Marshall Center managed the design, development and testing of the vehicle, which was built by The Boeing Company.

As time drew near for the manned lunar landings, NASA decided to provide a lunar roving vehicle that would extend the astronauts' range of exploration and their ability to carry equipment and lunar samples.

By 1969, Marshall was responsible for the design, development and testing of the new article. The vehicle contrasted with the towering Saturn vehicles. It was a fragile looking, open-space vehicle about 10 feet long with large mesh wheels, antenna appendages, tool caddies and cameras. Powered by two 36-volt batteries, it had four one-fourth hp drive motors, one for each wheel. The peculiar vehicle was collapsible for compact storage until needed, when it could be unfolded by hand.



Apollo 15 astronaut Jim Irwin on the surface of the Moon with the lunar roving vehicle.

Marshall engineers from the Center's laboratories contributed substantially to the design and testing of the navigation and deployment systems. In fact, the backup manual deployment system developed by Marshall proved more reliable than the automated system and became the primary method of deployment.

The rover was designed to travel in forward or reverse, negotiate obstacles about a foot high, cross crevasses about 2 feet wide, and climb or descend moderate slopes; its speed limit was about 14 km (9 miles) per hour. To assist in development of the navigation system, the Center created a lunar surface simulator, complete with rocks and craters, where operators could test-drive the vehicle. The simulator also was used during the mission as an aid in responding to difficulties.

A lunar rover was used on each of the last three Apollo missions in 1971 and 1972 to permit the crew to travel several miles from the landing craft. Outbound, they carried a load of experiments to be set up on the Moon; on the return trip, they carried more than 200 pounds of lunar rock and soil samples. The vehicle performed safely and reliably on each excursion and enhanced the astronauts' work efficiency. It handled as well and steered as easily on the Moon as on Earth.

For more information, visit the Web at: *http://history.msfc.nasa.gov/*

Greater solar activity may bring more gray days

NASA release

NASA-funded Earth Science researchers have discovered that during periods of increased solar activity much of the United States becomes cloudier, possibly because the jet stream in the troposphere moves northward causing changes to regional climate patterns.

The new study supports earlier findings by suggesting there is a relationship between increased cloud cover over the United States and the solar maximum, the most intense stage of activity on the Sun.

Previous studies have shown that during the solar maximum, the jet stream in the Northern Hemisphere moves northward. The jet stream guides storms and plays an important role in cloudiness, precipitation and storm formation in the United States.

This research is part of the NASA Earth Science Enterprise program, which is dedicated to understanding how Earth is changing and what consequences these changes have for life on Earth.

For more information, visit the Web at: *http://www.gsfc.nasa.gov/topstory/20010712cloudcover.html*

Answers

Continued from page 5

1. So that causes, and the means for prevention, can be identified.
2. D. Montreal
3. Stop, drop and roll
4. True
5. D. Always
6. False. A "tornado watch" means conditions are right for tornado formation. A "tornado warning" means a tornado has been spotted.
7. Zero
8. 10 inches
9. Only personnel who have completed the blood borne pathogens course.
10. Emergency Preparedness.

Courtesy photo

Teachers visit NASA

Teachers from across the country are getting first-hand insight into what is happening at the Marshall Center. The teachers, participating in the NASA Educational Workshops (NEW) Program, will be visiting the Center through Friday. From left are, front row, Terry Sue Fanning; Amy Stoyles; Heidi Gregorski; Ellen Holmes; and Myra Turner. Second row, Sean Richardson; Susan Beauregard; Pat Atkinson; Kay Jallos; and Lisa Beauregard. Third row, Christine Blake; Patty O'Neill; Kathy Wright; Hallie Snow; and Suzanne Harrison. Fourth row, Nancy Gifford; Jerry Murkerson; Susie Riffe; Rosemary Shaw; Dyanna Brent; and Bob Stremme. Fifth row, Gabriel Viego; Valerie Tuck; Kati Searcy; and Ken Huff. Standing at rear are Dr. William O. Robertson and Leesa Hubbard both from the Education Programs Office.

Sverdrup Technology announces Computer Numeric Controls/Precision Machining Scholarship recipient

Sverdrup release

Michael Wayne Wright of Cullman, Ala., has been named the recipient of Jacobs Engineering Group Inc.'s subsidiary Sverdrup Technology's first Computer Numeric Controls (CNC)/Precision Machining Scholarship.

The full two-year scholarship at Wallace State Community College in Hanceville, includes tuition, fees, tools and books.

He is the son of Terry and Elizabeth Ann Wright.

Sverdrup is the prime contractor for the Engineering, Science and Technical support contract for the Marshall Center.

"The intent of this scholarship is to encourage more of our high school graduates to pursue two-year technical degrees in precision machining and to become highly skilled craftsmen," said Lon Miller, Sverdrup vice president and general manager. "The ultimate goal is to become a diamond-turning machinist through gaining a basic understanding of mathematics, CNC programming, and optics."

Diamond turning is a process that uses highly accurate precision machines to cut metals and glass for large optical components. Sverdrup supports Marshall in actively developing processes to manufacture these components for the next generation of advanced visible and X-ray space-based telescope systems.

Wright was chosen from several North Alabama applicants who met the criteria for consideration. The selection committee included Wes Brown, Marshall Center diamond turner; Chuck Meadows, machining instructor from Wallace State; Howell Lee, of the office of U.S. Rep. Bud Cramer of Alabama; and Jim El-Ibrahim, and Dan Newman, both Sverdrup engineers.

Jacobs Engineering Group Inc. is one of the world's largest providers of professional technical services. With more than 20,000 home office employees, the company offers full-spectrum support to industrial, commercial and government clients in diverse markets. Services include scientific and specialty consulting as well as all aspects of design, construction, and operations and maintenance.

Wright

Marshall picnic

The Marshall Center's annual picnic — Family Fun Day — will be held from 10 a.m.-3 p.m. Aug. 25 at the Marshall picnic area. Meal tickets — at $6 each — are on sale through admin officers. Tickets purchased by Aug. 1 will receive two door-prize tickets in addition to the lunch ticket. Tickets purchased Aug. 2-17 will receive one door-prize ticket. Retirees may purchase meal tickets from Bill Stafford at 544-0252 in Bldg. 4752.

Blood drive

The American Red Cross blood drive will be held from 8 a.m.-1:30 p.m. Friday at Bldg. 4752. All blood types are urgently needed. Donors will receive a gift certificate for a free Domino's pizza and a Red Cross water bottle as a "thank you." Those whose last names begin with A-B should donate between 8-8:30 a.m.; C-F, 8:30-9 a.m.; G-H, 9-9:30 a.m.; I-L, 9:30-10 a.m.; M-P, 10-10:30 a.m.; Q-S, 10:30-11 a.m.; T-Z, 11-11:30 a.m. If unable to make the assigned appointment time, the Red Cross will be available until 1:30 p.m.

TD marks 1 million hours without a lost-time accident

Marshall's Space Transportation Directorate is celebrating 1 million hours without a lost-time accident from 11 a.m.-1 p.m. July 26 at the Marshall picnic pavilion. All directorate civil servants and contractors are invited to attend. Lunch will be served. Pick up meal tickets from management support assistants by July 24. Bus transportation will be available from Bldgs. 4203 and 4666 beginning at 10:30 a.m. For more information, call Debbie Scrivner at 544-5662.

Traffic tickets

Marshall's Protective Services Department will begin forwarding Armed Forces Traffic Tickets (DD Form 1408) to supervisors of Marshall personnel cited by the Army. These tickets may be issued by the Army in lieu of monetary tickets for moving traffic violations (e.g., speeding, failure to wear your seat belt, and failure to yield right of way). Please be advised that if you receive one of these tickets, the points will be assessed against both your Army and Marshall driving record. If you accumulate 12 points within a 24-month period, your installation driving privileges may be revoked for a six-month period. Supervisors are requested to complete the appropriate portion on the back of the DD Form 1408 and return it to the Protective Services Department within 10 workdays. Protective Services would like to remind everyone to drive safely, buckle up, and obey all traffic laws.

Upcoming classes

Virtual Reality seminar

Introduction to Virtual Reality Technology and Applications will be broadcast on Marshall Continual Learning Channel from 1-3 p.m. July 25-27. This live seminar may be viewed in Bldg. 4200, room G13 or on any Marshall television that receives Channel 14. This course will give an overview of the current state of virtual reality research and applications, as well as a glimpse into the future of virtual reality systems. To register for the seminar and receive materials, send your full name, the name of this seminar and your work phone number to: *edtec@msfc.nasa.gov*

Employee resume training

NASA STARS Online Resume Builder training — will be held July 24 and 25 in Bldg. 4200, room 329. There will be three one-hour sessions each day. Session 1 will be from 8:30-9:30 a.m.; Session 2, from 10-11 a.m.; and Session 3, from 1-2 p.m. Each session is limited to 20 participants. The training will familiarize Marshall civil servants with NASA STARS — NASA Automated Staffing and Recruitment System's Online Resume Builder, and assist employees in creating a "whole person" resume that best represents their skills and competencies. Registration is not required. A sign-in sheet will be available. For more information, call LaVerta McGlathery at 544-7560.

Clubs and meetings

Marshall Association meets

The Marshall Association will meet at 11:30 a.m. July 25 in the Bldg. 4203 cafeteria. Jan Wells, mayor of Madison, will speak. Call Efrem Hanson at 544-6340 by July 23 to make reservations. The menu for the event is chicken teriyaki over rice, green beans, rolls, iced tea and assorted cookies. The $7.50 cost of the meal will be collected at the door.

Shuttle Buddies meet

The Shuttle Buddies will meet for breakfast at 9 a.m. July 23 at Mullins Restaurant on Andrew Jackson Way. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.

Employee Ads

Miscellaneous

★ Sunbeam gas grill w/o propane bottle $55; redwood patio chair w/cushion, $50. 881-6040
★ Macintosh Performa 600, complete w/hard drive, keyboard, monitor, cd drive, microphone, $250. 353-0370 after 5 p.m.
★ Computer memory, 64MB, 8x64-PC100, 168 pin, new, $17.50; Quicken 2001 Basic, new in box, $9. 837-0625
★ CONN alto Saxophone w/hard case, no flaking of finish, no dents, $450 obo. 653-3625
★ Motorcycle helmet, full face, never worn, red design, $60 obo. 864-0465
★ Truck bedliner/tailgate, Protecta, fits 89-98 Chev./GMC regular bed, installed, $50. 864-0465
★ Hotpoint washer and dryer, $160. 533-5942
★ Sofa, contemporary, floral, $375; coffee table, maple, $50; queen size quilt, new $50. 534-0930
★ USR 56k modem, external; PC/Mac; Macintosh cable; CD-ROM/box, $50. 353-6635
★ Walking horses; black, stallion, perfect heart on forehead; gelding, kids' show horse, excellent bloodlines. 714-0317
★ N64 game console with 9 games and all accessories, $150. 461-8680
★ Three Missionary style twin beds, makes separate beds or bunk/loft unit, $275. 852-5092
★ Document frames, 8-1/2x11, 11x14, new; 0.065 weed trimmer line, $3; Flying Models magazine, years 1968-75, $2 each; blow dryer. 881-8648
★ Kimball console piano with oak cabinet, $1,900 obo. 729-8397
★ Big screen TV, Mitsubishi, 42", $450. 353-0370 after 5 p.m. or leave message
★ Side-by-side twins stroller, $30; white metal toddler bed, $15. 723-4983
★ Medela Pump-in-Style breast pump, maternity clothes. 880-2290
★ Round Oak table, 52", with six oak chairs, $250. 773-7730
★ Pro treadmill, wide trek, arm skis, variable pitch and speed, $225. 682-5181
★ Kenmore large microwave, 1400 watt, w/ owners manual, $50. 353-0370 after 5 p.m.
★ Adams titanium driver, Model 824FC+ (slice control), 10.5 deg., RH, reg. flex, $100. 881-6049
★ Coldspot window air conditioner, 14,000 BTU, $150. 883-8233
★ Apple & 486 computer systems, 72MB Ram, 2G HD, printer, books, software, etc. $150 obo. 828-6213
★ Toro 12HP lawn tractor, 32" cut, 4 yrs. old, $750. 851-0871
★ Temporary electric pole for construction purposes. 259-1834
★ 1976 Alacraft 15' runabout, 50HP Mercury motor, boathouse kept, w/trailer, $1,500 obo. 256-582-5210
★ Indoor rocking chair, $50. 881-8674
★ Antique Duncan-Fyfe sofa and mahogany coffee table, $290 for both; boy's rocking horse, $25. 881-8674
★ Two twin beds, mattress, springs and metal frame, 1-year old, $50 each. 658-2471

Vehicles

★ 1995 Chevy Astro van, eight passenger, 113K miles, $6,200. 721-2239
★ 1998 GMC Jimmy SLT, 4-door, 13K miles, pewter, leather, automatic temperature control, $16,900. 881-5736
★ 1995 Buick Park Avenue, 4S, leather, black, 79K miles, $10,500. 852-7206
★ 1996 Windstar GL van, 99K miles, all-power, rear a/c, AM/FM cassette, $6,500. 883-5472
★ 1987 GMC Suburban, 4-door, 350, automatic, overdrive, new paint, CD player, trailer hitch, 132K miles, $2,450. 256-753-2278
★ 1995 Jeep Grand Cherokee Laredo, 4WD, V-8, 81K miles, burgundy, $10,200. 256-233-4815
★ 1993 Acura Integra, 71K miles, $6,500. 881-1449
★ 1969 Camaro, new 400 SB Chevy (500 miles), 4-speed Muncie, 3.73 rear-end gear, needs paint/upholstery, $9,000 obo. 509-3392
★ 1999 Mitsubishi Eclipse RS, black, 34.5K miles, CD, $11,500. 256-751-2812
★ 1997 Honda Civic LX, 4-door, auto, silver, PW/PDL, cruise, CD player, 53K miles, $9,900. 355-2052
★ 1998 Nissan Frontier, 4x4, manual, 45K miles, alloy wheels, new tires, air, $10,500. 931-438-7947
★ 1993 Toyota Camry LE, V-6, 85K miles, silver, CD, new tires, garaged, $7,900. 772-3981
★ 1992 Ford Crown Victoria LX, 43K miles, garaged, original owner, $5,400. 881-4229
★ 2000 Chevy Impala, midnight blue, am/fm/cd, 18,250 miles, $15,999. 864-2629
★ Ranger, Custom, long-bed, Leer shell, auto, a/c, power, 2.3L, original owner, well maintained, $2,500. 881-1462

Free

★ Pine trees suitable to make a pole building. 881-6040
★ Parts for 1971 Ford Bronco, passenger's door, chrome bumper w/hitch, dash panel and heater. 837-1405
★ LawnBoy push mower, runs, needs carb work, mid 80's model. 837-1405
★ Corner shower enclosure, frosted glass, brass frame w/door, used, good condition. 837-1405

Wanted

★ Computer desk in good condition. 880-9025
★ Someone with wood turning lathe to make parts to repair antique piano stool. 880-6792
★ Adjustable free weight bench. 883-5396

Found

★ Silver necklace, found in hallway outside of Credit Union, Bldg. 4202. Call 544-0410 to identify

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