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Marshall Star, December 21, 2011 Edition

MARSHALL STAR

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Marshall, Stennis Conclude 2011 J-2X Engine Testing

NASA web feature

NASA conducted its final J-2X rocket engine test of the year Dec. 14, the 10th firing in a series of tests on the new upper-stage engine that will carry humans farther into space than ever before.

Image right: On Dec. 14, NASA engineers conducted their final J-2X engine test for 2011 -- the 10th in a series -- at the A-2 test stand at the Stennis Space Center. The upper stage engine is a key component of the Space Launch System, a new heavy-lift launch vehicle capable of missions beyond low-Earth orbit. (NASA/SSC)



The J-2X engine was test fired on the A-2 Test Stand at NASA's Stennis Space Center. The 235-second test was performed at the 100 percent power level. The main focus of this test was to characterize engine performance calibration and the effects of fuel inlet pressure variations. The results of this test are being analyzed.

The engine -- No. 10001 -- now will be removed from the test stand to allow for addition of a nozzle extension and associated test facility modifications needed for additional engine tests in 2012.

The engine will be returned to the stand early in 2012 to resume the test series. These tests will characterize the J-2X engine with nozzle extension as needed for the Space Launch System. In addition, J-2X Powerpack testing in 2012 at the Stennis A-1 test facility will characterize the required range of fuel and oxidizer turbopump operating conditions. Meanwhile, three other J-2X engines, 10002 through 10004, are being manufactured for hot fire testing at Stennis planned through 2014.

The J-2X engine is being developed by Pratt & Whitney Rocketdyne for the Marshall Space Flight Center. It will provide upper-stage power for NASA's new Space Launch System. The SLS will carry the Orion spacecraft, its crew, cargo, equipment and science experiments to space -- providing a safe, affordable and sustainable means of reaching the moon, asteroids and other destinations in the solar system.

For information about NASA's Space Launch System, visit <http://www.nasa.gov/sls>.

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NASA, Industry Leaders Discuss New Booster Development for Space Launch System

By Amie Cotton



On Dec. 15, aerospace industry leaders from more than 70 companies attended the Space Launch System's Advanced Booster Industry Day held at the Marshall Space Flight Center. The event focused on a NASA Research Announcement for the Space Launch System's, or SLS, advanced booster.

Image left: Chris Crumbly, chair of the NASA Research Announcement Evaluation Team, addresses industry and center representatives at the Space Launch System's Advanced Booster Industry Day Dec. 15. (NASA/MSFC)

Marshall is leading the design and development of the SLS on behalf of the agency. The new heavy-lift launch vehicle will expand human presence beyond low-Earth orbit and enable new missions of exploration across the solar system.

For explorations beyond the first two test flights, the SLS vehicle will require an advanced booster with a significant increase in thrust over existing U.S. liquid or solid boosters.

"As we are forging ahead with Space Launch System development, we are pleased to have such a strong response from industry and look forward to their ideas and hardware demonstrations for advanced boosters concepts," said Todd May, SLS program manager. "Together, our expertise will enable an entirely new U.S. booster capability -- the largest and highest performing booster system ever produced -- to begin the journey to deep space safely and affordably."

Through this research announcement, NASA is seeking proposals for engineering demonstrations and/or risk reduction strategies for advanced booster concepts. The aim is to reduce risks while enhancing affordability, improving reliability and meeting performance goals during an initial 30-month phase prior to the full and open Design Development Test and Evaluation, or DDTE, competition. The total award value for the research announcement is \$200 million with multiple awards anticipated.

NASA anticipates initiating a full and open competition for the advanced booster system in FY2015 with award anticipated in FY2016 and hardware delivery in the FY2019 timeframe. The 130-metric-ton, evolved SLS is slated for completion following the 2021 test flight.

For more information on SLS, visit www.nasa.gov/sls.

Cotton, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

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Marshall Meets -- and Exceeds -- Its CFC goal!

The Marshall Space Flight Center's workforce met -- and exceeded -- the center's 2011 CFC goal of \$700,000. To date, contributions total \$709,252. Way to go, team!



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Director's Corner



Robert Lightfoot. (NASA/MSFC)

Like me, I'm sure in the past couple of months that you've all noticed the flyers for many going-away parties. They're on bulletin boards, lobby walls, elevators, and in your email. In all, around 150 civil service employees are retiring from NASA.

This is a milestone in their lives. They're setting out on new journeys. Some will continue working in the aerospace field. Some will start new businesses or pursue a second career like teaching. Others are looking forward to travel and a break from their busy work lives. It's a transition that's not always easy.

These folks have made numerous contributions to this center, this agency, and this nation. They represent hundreds of years of service and expertise.

Many of them have spent decades here and devoted their lives to the exploration of space and the advancement of science and technology.

They leave behind a proud legacy for Marshall, just as another group of retirees left a legacy for them. That leaves Marshall's future legacy in the hands of those of us who remain. We've got some big shoes to fill.

I know everyone's busy, but I hope you will all take time in one form or another to acknowledge these folks, express your gratitude for what they meant professionally and personally, and wish them well on their future. They're our colleagues, friends in many cases, and definitely part of our family.

To them, thanks for all you've done and best wishes on the future.

Robert

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Marshall Center Signs Commercial Agreement with Sierra Nevada

NASA news release

The Marshall Space Flight Center is entering into a Space Act Agreement with Sierra Nevada Corp. Space Systems of Louisville, Colo., to provide key wind tunnel testing of a new spacecraft designed to transport crew and cargo to and from the International Space Station.

Image right: Robert Lightfoot, left, director of the Marshall Center, and Mark Sirangelo, head of Sierra Nevada Space Systems of Louisville, Colo., sign a Space Act Agreement at Sierra Nevada's Louisville Facility to allow the company to conduct wind tunnel testing at the Marshall Center on a new spacecraft design. (Sierra Nevada/Steve Crecelius)

Marshall will perform wind tunnel tests for Sierra Nevada's Dream Chaser orbital crew vehicle, a spacecraft that looks like a small space shuttle. The tests will simulate speeds ranging from Mach .2, or 152 mph at sea level, to Mach 5, or 3,811 mph at sea level, to provide Sierra Nevada with aerodynamic data about how the vehicle reacts at varying speeds and atmospheric conditions. Marshall will provide engineering support and data processing throughout the test series. The agreement could lead to joint development, testing and operations of advanced space systems -- including innovative design and fabrication techniques.



"Helping our commercial partners be successful is a top priority, and we are pleased to be working with Sierra Nevada on Dream Chaser," said Teresa Vanhooser, manager of the Flight Programs and Partnerships Office at Marshall. "Our experienced workforce and unique trisonic wind tunnel offer our partners a proven, quick and affordable way to test their Dream Chaser vehicle, and will aid in the development of the capability to transport astronauts to the International Space Station."

"We are extremely pleased to be adding the Marshall Center to our Dream Chaser Orbital spacecraft team, which now includes seven NASA centers," said Mark Sirangelo, head of Sierra Nevada Space Systems. "Marshall has been at the forefront of many significant aerospace programs, and we are fortunate to have their terrific people and valuable technical capabilities assisting us in the development of our vehicle. Our partnership will enable us to reach low-Earth orbit sooner and safer. We look forward to a long and mutually rewarding relationship and to expanding our presence in Alabama."

Marshall's 14-square-foot trisonic wind tunnel is capable of conducting tests at subsonic, transonic and supersonic wind speeds. Transonic speeds are close to Mach 1, the speed of sound, or 760 mph at sea level, and the facility can achieve wind speed as great as Mach 5.

For more information about the NASA Commercial Crew Program, visit <http://www.nasa.gov/commercialcrew>.

Final Space Shuttle Rocket Motor Processing Completed

By Sanda Martel



Crews at ATK Launch Systems Inc., in Clearfield, Utah, recently completed processing the final piece of space shuttle reusable solid rocket motor hardware. The component, a case cylinder, was disassembled, coatings and materials removed, proof tested, repaired and inspected to verify conformance for future reuse. This hardware flew on the last shuttle mission, STS-135, which launched from Kennedy Space Center July 8 and landed there July 21.

Image left: The Alliant Techsystems Inc. Component Refurbishment Center crew with the final piece of case hardware processed under the space shuttle reusable solid rocket motor program. (ATK)

"This is a major milestone for the Shuttle-Ares Transition Office," said Jeff McCaleb, manager of Reusable Solid Rocket Motor transition effort at the Marshall Space Flight Center. The Shuttle-Ares Transition office, headed by Roy Malone, is responsible for the identification and disposition of all space shuttle flight and ground hardware and other assets and issues associated with the shuttle program.

"This event represents the completion of all shuttle motor refurbishment work and we now look to the future and the transfer of hardware required for the Space Launch System," said McCaleb. Any hardware not required by the Space Launch System will be excessed.

The Space Launch System program, managed by the Marshall Center, will deliver the nation's next advanced, heavy-lift vehicle. The most powerful rocket ever built, its design maximizes efficiency and minimizes cost by leveraging investments already made in legacy launch hardware and systems, while also using evolutionary advancements in launch vehicle design.

"The employees at ATK's Clearfield, Utah, Component Refurbishment Center have always taken great pride in performing their work at the highest quality and ahead of schedule and in particular for this activity," said McCaleb. "Their dedication in this final effort has been amazing, but after working with them over the past 20 years, it's of no surprise."

After each space shuttle landed, the twin solid rocket boosters were recovered after they splashed down in the Atlantic Ocean. They were disassembled at Kennedy and shipped by rail to the Utah contractor facility where they were unloaded and the segments further disassembled into individual components. Remaining coatings and materials were removed, and once at the bare metal condition, each part was proof tested, repaired and inspected to verify conformance to reuse requirements. Components were then returned to Alliant Techsystem's Promontory, Utah, facility as inventory for new casting segments. Beyond the sizable 12.5-foot-diameter components, each piece of nozzle and igniter metal hardware, joint pins, pin retainer bands, reusable bolts, railcars, rail car covers, grain covers and handling ring assemblies also was refurbished.

Counting both space shuttle flights and static tests, more than 700,000 parts were processed at the Component Refurbishment Center throughout the life of the Space Shuttle Program, yielding millions of dollars in savings compared to the cost of new metal hardware.

This processing milestone represents the last of more than 30 years of shuttle motor processing at Alliant Techsystem's refurbishment facility.

Martel, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

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Student Teams Gearing Up for NASA Great Moonbuggy Race April 13-14, 2012

By Rick Smith

NASA is challenging aspiring space racers to gear up for the 19th annual [NASA Great Moonbuggy Race](#), set for April 13-14, 2012, at the [U.S. Space & Rocket Center](#) in Huntsville.

Image right: Racers from the University of Puerto Rico in Humacao speed to first place -- for the second year in a row -- in the college division of the 18th annual NASA Great Moonbuggy Race, held April 1-2 at the U.S. Space & Rocket Center in Huntsville. The University of Puerto Rico is the only school worldwide to field a team in the competition every year since its start in 1994. (NASA/MSFC)



Participating high schools, colleges and universities may register up to two teams and two vehicles. International registration for the 2012 race closes Jan. 9. Registration for U.S. teams closes Feb. 10. [Complete rules](#) and [registration information](#) are available online.

Since 1994, NASA has challenged student teams to build and race human-powered rovers of their own design. These fast, lightweight "moonbuggies" address many of the same engineering challenges overcome by Apollo-era lunar rover developers at the Marshall Space Flight Center in the late 1960s. The Marshall Center organizes the race each year for NASA.

The original rover first was driven on the moon's surface by Apollo 15 astronauts David Scott and James Irwin on July 31, 1971. Two more rovers followed during the Apollo 16 and Apollo 17 missions in 1972, expanding astronauts' reach on the lunar surface and permitting greater focus on scientific exploration.

As they prepare for the NASA Great Moonbuggy Race, student teams carry on that tradition of engineering ingenuity, competing to post the fastest vehicle assembly and race times in their divisions, while incurring the fewest penalties. The challenging course, built each spring on the outdoor museum grounds of the U.S. Space & Rocket Center, doesn't make that easy. A looping, curving half-mile of gravel embankments, sand pits and obstacles designed to mimic lunar craters and ancient, fossilized lava flows, the course gives riders as realistic a moon-traversing experience as possible -- minus the airlessness and weightlessness.

Prizes are awarded to the three teams in each division that finish with the fastest final times. NASA and industry sponsors present additional awards for engineering ingenuity, team spirit and overcoming unique challenges -- such as the race

weekend's most memorable crash.

Teams from Puerto Rico scored the top trophies in 2011. Teodoro Aguilar Mora Vocational High School of Yabucoa, Puerto Rico, won first place in the high school division with a best time of 3 minutes 18 seconds -- just one second over the current course record. The University of Puerto Rico in Humacao, the only school to enter a moonbuggy every year since the race's start in 1994, posted a best time of 3 minutes 41 seconds to win the college division for a second straight year.

Participation in the race has increased annually from just eight college teams in 1994 -- the high school division was added two years later -- to more than 70 high school and college teams from all over the world in 2011.

Nearly 20,000 people watched live and archived coverage of the spring 2011 race on UStream, an interactive, real-time webcasting platform. Watch archived footage of the competition [here](#). Find a complete roster of last year's winners and more information about the competition [here](#).

Smith, an AI Signal Research Inc. employee, supports the Office of Strategic Analysis & Communications.

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Marshall Star to Take Break for Holiday Season; Resumes Jan. 11 with Special 2011 Year in Review

Dec. 21 will be the last issue of the Marshall Star for 2011. The Star, published 50 times each year, will not publish for two weeks during the holiday season.

Publication will resume Jan. 11, 2012, with a special Year in Review, highlighting the Marshall Space Flight Center's 2011 accomplishments. Visit <http://www.nasa.gov/centers/marshall/about/star/> at 2 p.m. for the new edition.

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8th Annual Weigh to Win Competition Begins Jan. 23

Submitted by the NASA Wellness Center

The 8th annual 2012 "Weigh to Win" competition at the Marshall Space Flight Center's NASA Wellness Center will begin Jan. 23 and continue through March 18.

Each year, teams of five people compete to lose the most weight. In an initiative toward a healthier NASA workforce, the Wellness Center has developed a program that is fun, motivating and rewarding.

Registration dates are Jan. 9-20 at the Wellness Center. The cost to join the contest is \$5. Prizes will be awarded to the first-, second- and third-place teams, and individual prizes will be given to the winning male and female contestants.

The Wellness Center provides a lifestyle and nutritional component that helps individuals learn how to take control of eating a healthy diet and exercising properly. Health and fitness professionals are on staff to help contestants safely begin an exercise program and track their progress. Participants also are encouraged to attend a health and nutrition seminar given by a registered dietician, providing the tools to optimize nutritional requirements and speed up metabolism without drugs or dramatically changing the foods a person loves. Details about when and where the seminar will take place will be announced at a later date.

"As always, we are looking forward to a fun and productive way to start the new year," said Michael Clark, exercise specialist for the Wellness Center, supporting the Office of Human Capital. "The overall goal is to help the NASA community get in shape and stay active for 2012."

For more information, contact Bill Stafford at 544-0252.

Obituaries

John G. Simpson III, 83, of Huntsville died Nov. 29. He retired from the Marshall Center in 1981 as an experimental facilities and equipment engineer. He is survived by his wife, Debra Simpson.

Prince Thomas Jones Jr., 85, of Huntsville died Dec. 4. He retired from the Marshall Center in 1981 as an electronics technician. He is survived by his wife, Charlotte Jones.

Kermit Odell Hudson, 88, of Hartselle died Dec. 5. He retired from the Marshall Center in 1984 as a technical management engineer.

John C. Moore Jr., 93, of Fayetteville, Tenn., died Dec. 10. He retired from the Marshall Center in 1974 as a quality assurance engineer. He is survived by his wife, Florence Marie Davies Moore.

James Derington, 85, of Huntsville died Dec. 14. He retired from the Marshall Center in 1982 as an electronics engineer supervisor. He is survived by his wife, Jeanne W. Derington.

Find this article at:

<http://www.nasa.gov/centers/marshall/about/star/index.html>