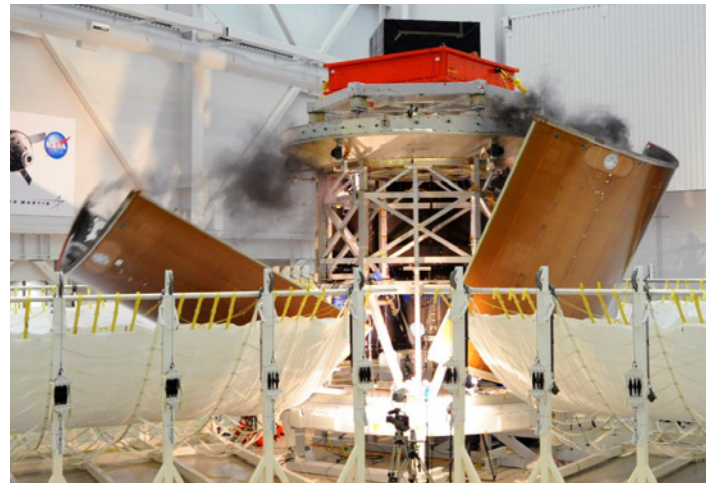
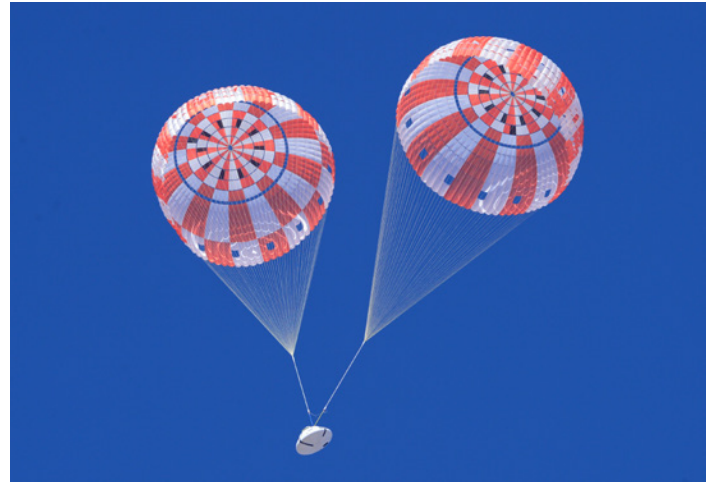
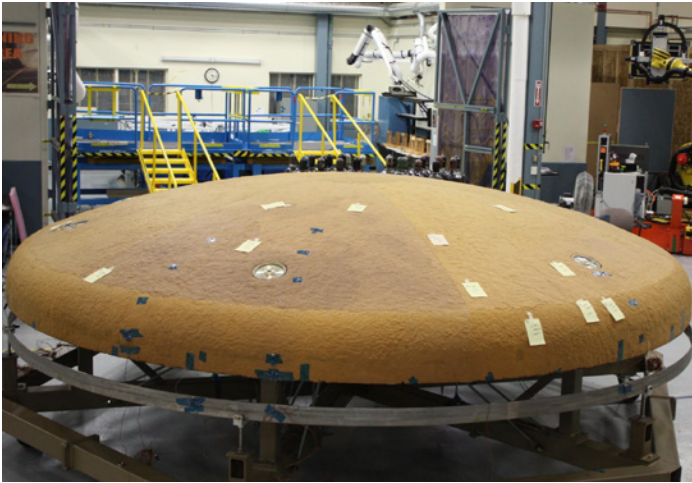
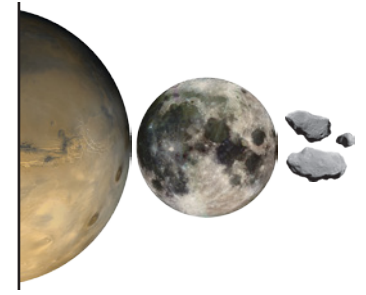


**MONTHLY
ACCOMPLISHMENTS**
August 2013

Orion



Orion team,
As you know, we are working at a fever pitch to finish EFT-1 hardware.

To date, manufacturers from across the country have delivered more than 66,000 parts to the Kennedy Space Center, where the crew module, service module and launch abort system assembly are all well under way. In Massachusetts, our heat shield team is holding to their

plan with the final Avcoat™ gunning/cure cycle (top left) projected to finish at the end of the month. In Denver, another key software delivery was made to the Integrated Test Lab. We fired our propulsion system and tested our service module fairings (bottom right) in California, and the Orion parachute (top right) system performed successfully at record altitude in Arizona. The team conducted a successful test with the U.S. Navy in Virginia to demonstrate EFT-1 flight article recovery (bottom left). In Alabama, the EFT-1 Delta IV rocket is also on schedule for launch in just 13 months. **Continued on P.2**



Orion crew and service modules continue to shape up for flight

Assembly, integration and production continues to progress on the Orion crew module at the Operations and Checkout Facility (O&C) at Kennedy Space Center in Florida. In August, the Orion team completed hundreds of welds for the spacecraft's propulsion, life support, and environmental controls systems. The hydrazine propellant tanks and mounting struts were installed on the crew module. The picture above shows the intricate packaging of multiple subsystems mounted outside the crew module, including the tanks, tubing, and wiring. All propulsion tube welding is expected to be completed by the end of September.

The team completed the forward bay harness installation and conducted the first series of harness testing on the vehicle. In addition, the team began installation of the forward bay development flight instrumentation harnesses. Work on the aft bay harnesses is scheduled to be completed by late September.

On the Orion service module, aft wall installations were completed, and the spider leg and cross-beam installations were started. The spacecraft adapter/service module test fixture components continue to be assembled. The conical spacecraft adapter acceptance test will make first use of this test fixture in September, to be followed by qualification testing of the entire service module structure in November. In addition, the team completed painting the service module's micro-meteoroid orbital debris panels.

Continued from P.1

This is just a sample of the great work that is being accomplished every day across this country.

It's impressive to see the huge amount of progress in the status reports and recent program photos:

Status Reports: 1.usa.gov/197tVwm

Photos: www.flickr.com/photos/nasaorion

It's critical that we finish well on the EFT-1 work so that we have a successful test flight and keep momentum on our EM-1 design work, program-to-program efforts and European Space Agency integration.

Of course, all of us would feel better if there were more certainty in our long-term plans. Discussions in the media on the federal budget impact and our mission can cause us to wonder what's going to happen next. It's important to remember that human spaceflight programs are often subjected to uncertainty given the lifecycle of these programs and their significance to our political leaders.

Some may look at the operational stage of a program like the International Space Station and think that getting there was so simple, but actually, there were a lot of changes for station and shuttle during their development. We need to remember that we're building a capability that serves our country with a lot of options, including destinations that will enable the coming decades of human exploration.

We have shown through all the perturbations that the Orion team is extremely innovative in meeting challenges. Our job is to build Orion and get our country flying in space and exploring the solar system. NASA leadership continues to convey to me their belief in the Orion system and this team specifically. It's an exciting time, and I feel very fortunate to be a part of this great endeavor. Thank you for your continued dedication to Orion and the exploration of space.


Mark Geyer

Orion's flight computer to command performance for EFT-1



The Lockheed Martin avionics, power and wiring team successfully delivered the flight Vehicle Management Computer (VMC) to the Kennedy Space Center Operations and Checkout (O&C) Facility on Aug. 7. One of the most critical components on the spacecraft, the VMC is responsible for managing all software commands that control the spacecraft's flight, communications and navigation systems throughout Orion's missions.

The VMC unit — designed, developed and tested by Honeywell in Glendale, Ariz. — executes the flight software that guides the vehicle, monitors vehicle health and status, and communicates with the other avionics hardware. The VMC has built-in fault tolerance

to ensure optimal safety of the crew, in the event one or more of its components fail.

Since EFT-1 will demonstrate the first application of the VMC technology in spaceflight, the team conducted rigorous acceptance level vibration and thermal cycle testing. Concurrently, Honeywell will also be testing a separate VMC unit known as the Proto Qualification Unit through Thermal Vacuum and Pressurization tests which will be completed prior to the EFT-1 mission to ensure it can operate properly in the harsh environments of spaceflight.

The VMC is now being integrated into the Orion spacecraft at the O&C in preparation for the initial vehicle power-on test planned for October.



Inspiring future generations

Lockheed Martin systems integration engineer Joe LeBlanc talks with teachers new to the Clear Creek Independent School District about the Orion spacecraft and NASA's Exploration Design Challenge. Lockheed Martin sponsored the Clear Lake Area Chamber of Commerce's New Teacher Luncheon on Wednesday, Aug. 14. More than 350 teachers attended, along with an additional 300 current teachers, school district representatives, business sponsors and elected officials who welcomed the teachers to the community.

www.nasa.gov/education/edc



NASA, U.S. Navy conduct Orion recovery operations at Naval Station Norfolk in Virginia

On Aug. 15, at the Naval Station Norfolk near NASA's Langley Research Center in Virginia, NASA and the U.S. Navy conducted a stationary recovery test on the Orion boilerplate test article in the water near a U.S. Navy ship. NASA and the U.S. Navy are conducting tests to prepare for recovery of the Orion crew module and forward bay cover on its return from a deep space mission. The stationary recovery tests allow the teams to demonstrate and evaluate the recovery processes, the hardware and the test personnel in a controlled environment.

During the test, the U.S. Navy Dive Team checked the capsule for hazards while sailors from the USS Arlington approached the capsule in inflatable boats and towed it back to the ship's flooded well deck. A second test will be conducted next year in the open waters of the Pacific Ocean.

A media briefing also took place during a portion of the testing. Briefing participants included Scott Wilson, NASA manager for Orion Offline Processing and Infrastructure Development,

Ground Systems Development and Operations (GSDO) Program; Jim Hamblin, NASA manager for GSDO Landing and Recovery Element Operations; and Cmdr. Brett Moyes, who serves as the Future Plans branch chief for U.S. Fleet Forces Command.

More than 40 media attended the event, including representatives from almost every local media outlet and a half dozen different countries, as well as approximately 30 social media followers who reported on the operations. A few examples include:

- | | |
|--------------|---|
| WAVY | bit.ly/19xGO4m |
| Daily Press | bit.ly/14JKcBE |
| Pilot Online | bit.ly/16SmCpZ |
| WTKR | bit.ly/170J43H |

Next generation of explorers take the stage



NASA Administrator Charles Bolden formally welcomed the eight newest candidates to the astronaut corps and unveiled a space exploration roadmap that makes clear the global community is working together on a unified deep space exploration strategic plan, with robotic and human missions to destinations that include near-Earth asteroids, the moon and Mars.

At NASA's Johnson Space Center in Houston, the members of the 2013 astronaut class spoke with reporters about their new roles and their desire to help the agency push the boundaries of exploration

and travel to new destinations in the solar system. These next-generation American astronauts will be among those who will have the opportunity to fly on Orion as well as new commercial space transportation systems that are now under development. They also will be among those to plan and perhaps carry out the first-ever human missions to an asteroid and Mars.

During the event, media were given the opportunity to tour the Orion mock-up and ask questions of Mark Geyer, NASA Orion program manager.



Paul Marshall, Orion assistant manager for strategy integration, gave an overview on Orion's progress to Jeff Murray and David Sawyer from Senator Ted Cruz's office, in front of the Orion mock-up in the Johnson Space Center (JSC) Space Vehicle Mock-up Facility. Murray is the NASA Legislative Aide for the senator in his Washington, D.C., office and he interacts with the Senate Commerce Committee staff concerning NASA matters. Sawyer runs the senator's Southeast Texas Regional Office.



NASA Associate Administrator for Legislative and Intergovernmental Affairs Seth Statler (center) and his executive officer Jason Chitwood (left) toured Johnson Space Center facilities on Aug. 27-28. Marshall provided Statler and Chitwood an overview of the Orion program and an inside look at the spacecraft's mockup.



D.R.E.M.E.I.N.G B.I.G.

Orion team members Thanos Queenan (left) and Gina Calderon (center) joined NASA Education specialist Trinesha Dixon (right) at the D.R.E.M.E Foundation Community Science Fair, which was held on the campus of Texas Southern University on Aug. 9. Hundreds of students and teachers learned about the Orion spacecraft and NASA's Exploration Design Challenge. The Orion team conducted hands-on activities to educate them about Orion's parachute systems and radiation protection for astronauts on deep-space missions. The Community Science Fair, as designed by the Dr. Ronald E. McNair Educational (D.R.E.M.E.) Science Literacy Foundation, was created to present science, technology, engineering and math (STEM) information in an innovative and exciting atmosphere. The Foundation honors the life and legacy of the late Dr. Ronald E. McNair, a NASA astronaut who was responsible for various experiments and science-related activities onboard the space shuttle.

Orion engineers embark on Voyage Back to School

Orion team members helped to inspire future aerospace engineers while reviewing student projects displayed at NASA's Voyage Back to School event, held Aug. 15 at Space Center Houston. Lockheed Martin sponsored the event, during which Orion Deputy Program Manager Larry Price (below) provided a brief presentation on Orion as part of the NASA Summer of Innovation program. Space Center Houston opened up free to the public that evening, which allowed hundreds of kids to participate in hands-on activities and presentations about living and working in space. Pictured at top, NASA Astronaut and Orion Program Representative Rex Walheim (left) talks with a student about her Summer of Innovation project with NASA's Todd Hellner (right). Below, Lockheed Martin's Patrick Oliver (left) and Cynthia Hudy (bottom left) talk to students about their research on robotics, solar energy and recycling.



I am building Orion

Read about Doug Anderson, NASA Langley Research Center Orion configuration manager, at: [on.fb.me/18H9RND](https://www.facebook.com/18H9RND)

