MONTHLY ACCOMPLISHMENTS
January 2013

orion

EFT-1 heatshield skin-to-skeleton mate complete

The skin of Orion's heatshield was lowered onto the titanium support skeleton at Lockheed Martin's Waterton Facility near Denver, Colo., completing its mating operations. The heatshield is scheduled to ship to Textron in Wilmington, Mass., in March for installation of its ablative protective coating. The skin and skeleton will help give the spacecraft the strength to withstand its impact with the water's surface on landing in the Pacific Ocean, and provide the structure for the AVCOAT coating that will protect the vehicle and its crew from the nearly 5,000-degree- Fahrenheit temperatures that they would experience during a 27,000-mph return from Mars.
At five meters wide, it is the largest composite heatshield ever built. The heatshield design will be put to the test next year during Orion's first flight test – Exploration Flight Test-1.

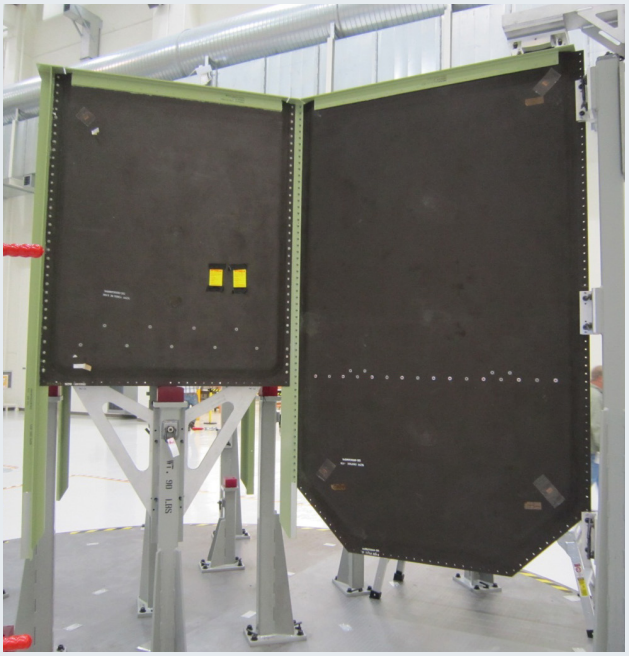
Initial avionics power-up procedures testing in Denver

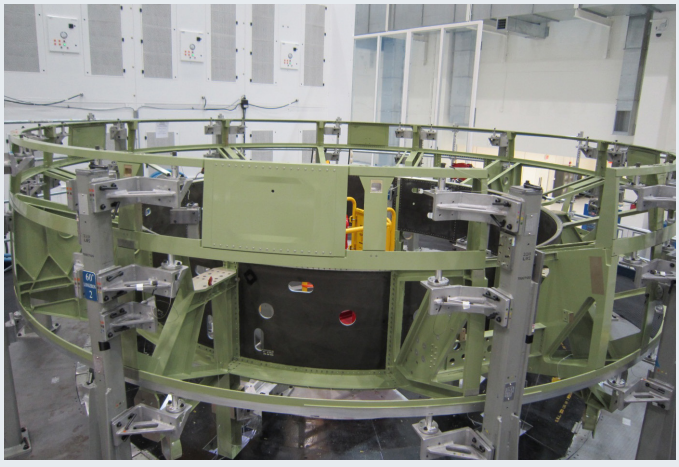
Testing of the procedures that will be used for initial power-on of the Exploration Flight Test (EFT-1) Crew Module during vehicle assembly, integration and processing in the Kennedy Space Center Operations and Checkout building was completed at the Denver Integrated Test Lab. Five procedures were successfully executed to configure ground test hardware, power the flight avionics on and off, and load data. The Integrated Test Lab is a high fidelity representation of the Orion spacecraft's avionics and ground systems where the software and hardware are integrated and tested in support of design verification and operational processes.

Service Module work continues

Work continues on the assembly of the EFT-1 Service Module with the second of six service module composite shear panels being shipped from the Michoud Assembly Facility to Kennedy Space Center and being installed with the four diamond panels in the Shear Web Assembly Tool (right). All six service module forward wall panels have now been loaded, measured and drilled on the service module structure at Kennedy Space Center and the fastener installation on the EFT-1 Service Module Phased Array Mass Simulators has been completed (bottom).

The final set of EFT-1 Service Module composite micro-meteoroid orbital debris panels has been delivered, along with the test fixture, to Marshall Space Flight Center for testing.



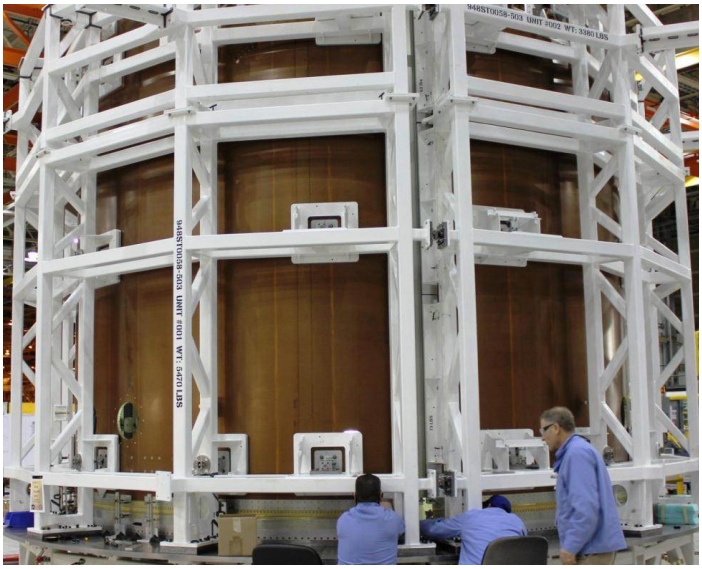


Stacked and ready for flight

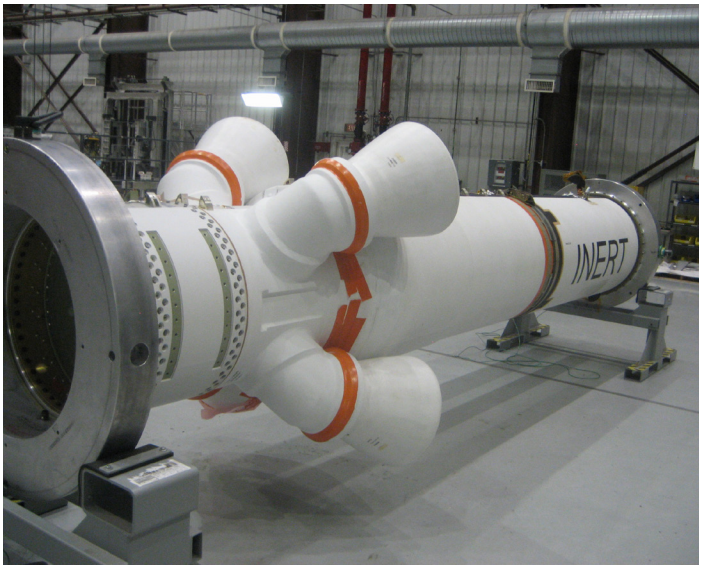
Final preparations are underway for the upcoming Parachute Compartment Drop Test Vehicle airdrop test in Yuma, Ariz. The vehicle will be released on a platform from a C-130 aircraft at 25,000 ft. During the drop test, one drogue chute will skip its first reefing stage, and both drogues chutes will have a normal second stage, then go full open. One main parachute will be rigged to represent a canopy failure (flagging main), which will result in a descent under two main chutes. Orion's air drop tests build an understanding of the chutes' technical performance for eventual human-rated certification.

Wind tunnel testing at Ames

Wind tunnel testing of the EFT-1 launch vehicle configuration, comprised of the Delta IV Heavy booster and upper stage topped by the Orion capsule, continues at Ames Research Center to define the ascent aerodynamics of this new vehicle configuration. Testing has been completed in the transonic 11 foot test section, providing data on aerodynamic characteristics in the flight regime at speeds below Mach 1.3. The subscale model has now been installed in the 9x7 foot test section in order to gather data for the supersonic phase of flight. Force and moment testing was conducted this past week, and buffet testing is scheduled for March.



All EFT-1 Service Module spacecraft adaptor jettison fairings have been installed in an assembly tool in preparation for work at the Michoud Assembly Facility.



Alliant Techsystems completed development flight instrumentation installation and functional tests for the EFT-1 Launch Abort Motor. Additional EFT-1 operations will continue through February.

NASA participated in the inauguration of President Obama on Jan. 21 in Washington, D.C., with two floats in the parade. A full-size Orion mockup, used during water testing at Langley Research Center, along with the Curiosity Rover model, were flanked by NASA employees and astronauts.

Media invited to view Orion work

Kennedy Space Center Director Bob Cabana, along with several members of Orion management, answered questions from reporters in front of the EFT-1 Crew Module during a media event on Jan. 30 at the Kennedy Space Center Operations and Checkout Building.

Service Module to be built by ESA

Following the signing of an agreement by NASA and the European Space Agency for ESA to provide a service module for Orion's Exploration Mission-1 in 2017, a joint all-hands meeting and press conference was held at Johnson Space Center to make the announcement public.