

# NASA's Orion spacecraft powers through first integrated system testing

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Engineers in the Operations and Checkout Building at NASA's Kennedy Space Center in Florida, perform avionics testing on the Orion spacecraft being prepared for its first trip to space later this year. Credit: Lockheed Martin

(Phys.org) —NASA's Orion spacecraft has proven its mettle in a test designed to determine the spacecraft's readiness for its first flight test—Exploration Flight Test-1 (EFT-1)—later this year. EFT-1 will

send the spacecraft more than 3,600 miles from Earth and return it safely.

The spacecraft ran for 26 uninterrupted hours during the final phase of a major test series completed April 8 at the agency's Kennedy Space Center in Florida. The test verified the [crew module](#) can route power and send commands that enable the spacecraft to manage its computer system, software and data loads, propulsion valves, temperature sensors and other instrumentation.

"This has been the most significant integrated testing of the Orion spacecraft yet," said William Gerstenmaier, associate administrator for NASA's human exploration and operations at the agency's Headquarters in Washington. "The work done to test the avionics with the crew module isn't just preparing us for Orion's first trip to space in a few months. It's also getting us ready to send crews far into the solar system."

In October 2013, NASA and Lockheed Martin engineers powered on Orion's main computer for the first time. Since then, they have installed harnessing, wiring and electronics. This was the first time engineers ran the crew module through its paces to verify all system actuators respond correctly to commands and all sensors report back as planned. More than 20 miles of wire are required to connect the different systems being powered.

"Getting all the wiring right, integrating every element of the avionics together, and then testing it continuously for this many hours is a big step toward getting to deep space destinations," said Mark Geyer, Orion program manager.

Engineers now are preparing the crew module for vibration testing, scheduled for the week of April 14. In May, the heat shield will be installed and, shortly thereafter, the crew module will be attached with

the [service module](#).

During EFT-1, an uncrewed Orion spacecraft will take a four-hour trip into space, traveling 15 times farther from Earth than the International Space Station. During its reentry into Earth's atmosphere, Orion will be traveling at 20,000 mph, faster than any current spacecraft capable of carrying humans, and endure temperatures of approximately 4,000 degrees Fahrenheit. The data gathered during the flight will inform design decisions to improve the [spacecraft](#) that will one day carry humans to an asteroid and eventually Mars. EFT-1 is targeted for launch in December.

Provided by NASA

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