

NASA tests Orion spacecraft parachute jettison over Arizona

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Engineers testing the parachute system for NASA's Orion spacecraft increased the complexity of their tests Thursday, Jan. 16, adding the jettison of hardware designed to keep the capsule safe during flight.

The test was the first to give engineers in-air data on the performance of the system that jettisons Orion's forward bay cover. The cover is a shell that fits over Orion's [crew module](#) to protect the spacecraft during launch, orbital flight and re-entry into Earth's atmosphere. When Orion returns from space, the cover must come off before the spacecraft's parachutes can deploy. It must be jettisoned high above the ground in order for the parachutes to unfurl.

"This was a tough one," said Mark Geyer, Orion program manager. "We'd done our homework, of course, but there were elements here that could only be tested in the air, with the entire system working together. It's one of the most complicated tests that we'll do, so we were all excited to see it work just as it was meant to."

Previous parachute tests at the U.S. Army's Yuma Proving Grounds in Arizona tested the performance of the parachutes in various conditions without a forward bay cover. Adding the cover and its jettison, along with the deployment of three additional parachutes to pull the cover away from the crew module and lower it to the ground, added a level of complexity to the testing.

"The parachute deployment and forward bay cover jettisons are two of

the most difficult things for us to model on computers," said Chris Johnson, project manager for the parachutes. "That's why we test them so extensively. These systems have to work for Orion to make it safely to the ground, and every bit of data we can gather in tests like these helps us improve our models and gives us more confidence that when we do it for real, we can count on them."

The forward bay cover is jettisoned using a thruster separation system built by Systima Technologies Inc. of Bothell, Wash. Lockheed Martin, prime contractor for Orion, tested the system for the first time on the ground in December. Two more ground tests will simulate different types of stresses on the cover, such as a potential parachute failure or loads on the spacecraft. NASA also plans a second airborne test with the forward bay cover to evaluate its performance with a failed parachute.

Orion will be put to its first test in space during its first mission, Exploration Flight Test-1 (EFT-1), in September. EFT-1 will have an uncrewed Orion launch to an orbit 3,600 miles above Earth, well beyond the distance traveled by spacecraft built for humans in more than 40 years. After circling Earth twice, Orion will re-enter the atmosphere at speeds as fast as 20,000 mph before the [parachute](#) system slows it down for a splashdown in the Pacific Ocean.

Provided by NASA

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