

NASA conducts Orion parachute testing for orbital test flight

December 22 2011, By J.D. Harrington and Josh Byerly



A test article that mimics the Orion spacecraft is seen under parachutes Tuesday as NASA engineers conducted a drop test above Yuma, Ariz. The Orion team was examining how the spacecraft would land under only two parachutes, instead of the normal three. Credit: NASA/James Blair

(PhysOrg.com) -- NASA successfully conducted a drop test of the Orion crew vehicle's parachutes high above the Arizona desert Tuesday in preparation for its orbital flight test in 2014. Orion will carry astronauts deeper into space than ever before, provide emergency abort capability, sustain the crew during space travel and ensure a safe re-entry and landing.

A C-130 plane dropped the Orion test article from an altitude of 25,000 feet above the U.S. Army's Yuma Proving Grounds. Orion's drogue

chutes were deployed between 15,000 and 20,000 feet, followed by the pilot parachutes, which then deployed two main landing parachutes. This particular drop test examined how Orion would land under two possible failure scenarios.

Orion's parachutes are designed to open in stages, which is called reefing, to manage the stresses on the parachutes after they are deployed. The reefing stages allow the parachutes to sequentially open, first at 54 percent of the parachutes' full diameter, and then at 73 percent. This test examined how the parachutes would perform if the second part of the sequence was skipped.

The second scenario was a failure to deploy one of Orion's three main parachutes, requiring the spacecraft to land with only two. Orion landed on the desert floor at a speed of almost 33 feet per second, which is the maximum designed touchdown speed of the spacecraft.

Since 2007, the Orion program has conducted a vigorous parachute air and ground test program and provided the chutes for NASA's successful pad abort test in 2010. Lessons learned from this experience have improved Orion's parachute system.

Provided by JPL/NASA

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