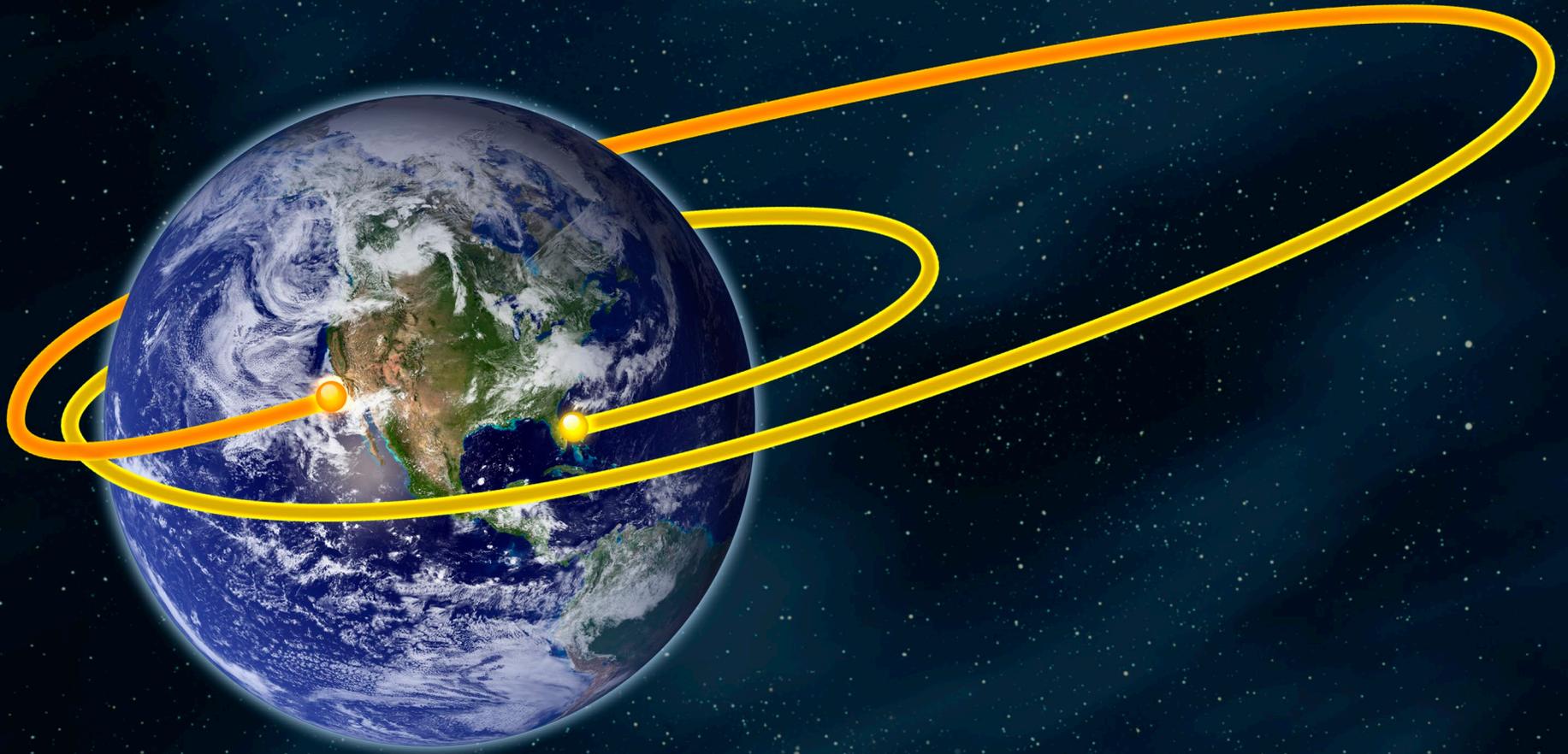


EFT-1

EXPLORATION FLIGHT TEST - 1



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EXPLORATION FLIGHT TEST - 1

NASA and Lockheed Martin will evaluate several of the most significant systems required for deep space missions during Orion's first test flight, Exploration Flight Test-1 (EFT-1). Lockheed Martin is the prime contractor conducting the test flight.

During EFT-1, an uncrewed Orion will launch from Cape Canaveral Air Force Base on a Delta IV Heavy rocket. Orion will orbit Earth twice, traveling approximately 3,600 miles above the Earth's surface—about 15 times farther than the International Space Station. This distance will generate more than 80% of the return velocity experienced during a reentry from the moon, which allows engineers to model expected reentries from future missions in deep space.

Twice during the mission, Orion will fly through the Van Allen Radiation Belt, a dense radiation field of highly energetic charged particles surrounding Earth. This exposure will help the team understand and mitigate radiation exposure, and to develop protective solutions before the first crewed mission.

At the conclusion of EFT-1 Orion will reenter Earth's atmosphere at 20,000 mph and endure temperatures of up to 4,000° Fahrenheit. Once the parachutes are deployed, the spacecraft will slow to 20 mph as it splashes down in the Pacific Ocean, near the Baja Peninsula.

The U.S. Navy and NASA Ground Systems Development and Operations teams will recover the Orion crew module. The spacecraft will be towed into the well deck of a U.S. Navy ship and then secured in a specially designed frame. Orion will then be transported from Naval Base San Diego to Kennedy Space Center, where the spacecraft flight data will be evaluated.

EFT-1 TIMELINE:

- Approximately 6 minutes after launch, the service module fairings are jettisoned away from the service module.
- Approximately 5 seconds later the Launch Abort System is jettisoned.
- At about the 2 hour mark, the upper stage second engine burn occurs. This burn raises Orion's orbit in order to create a high reentry velocity.
- At 3 hours and 20 minutes the crew module separates from the service module and the upper stage.
- From 3 hours 30 minutes to 3 hours 50 minutes Orion experiences the highest levels of radiation exposure as it flies through the Van Allen Radiation Belt.
- At about 4 hours and 15 minutes the crew module begins to encounter Earth's atmosphere again.
- At about 4 hours and 20 minutes the forward bay cover is jettisoned, allowing the parachutes to deploy, which will happen about 2 seconds later.
- At about 4 hours and 25 minutes the vehicle splashes down into the Pacific Ocean.

EFT-1 WILL TEST SYSTEMS CRITICAL TO THE SAFETY OF FUTURE ASTRONAUTS:

- Launch abort system separation
- Service module fairing separation
- Crew module separation
- Crew module environmental control
- Johnson Space Center Mission Control Center Operations
- Forward bay cover separation
- Parachute deployment
- Avionics and software performance
- Radiation exposure and protection
- Heat shield thermal and landing loads protection
- Guidance and navigation performance
- Attitude control
- Ocean recovery tactics

The performance of these critical systems will influence design decisions and validate existing computer models, ultimately reducing risks and costs for Orion's future flights. This test will also provide invaluable experience to prepare for Exploration Mission-1 (EM-1), during which Orion will be launched aboard NASA's Space Launch System for the first time.

EFT-1 IS HUMANITY'S FIRST STEP ON THE JOURNEY TO MARS.



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