Current Events

NASA Signs Agreement for a European-Provided Service Module

NASA Press Release, January 16, 2013

Orion is going international.

An earlier page in this issue provides additional reporting, including a journalist's question about designing a system with multiple destinations.

Orion is going international.

NASA signed an agreement in mid-December for the European Space Agency (ESA) to provide a service module for the Orion spacecraft's Exploration Mission-1 in 2017.

- *Watch Orion's Exploration Mission-1 animation*
- *View images from Orion Partnership News Conference*
- *View the Orion Service Module Briefing Graphics*

Above: As part of a new agreement between the two space agencies, the European Space Agency will provide the service module for NASA's Orion spacecraft. Image credit: NASA.

When the Orion spacecraft blasts off atop NASA's Space Launch System rocket in 2017, attached will be the ESA-provided service module – the powerhouse that fuels and propels the Orion spacecraft.

"Space has long been a frontier for international cooperation as we explore," said Dan Dumbacher, deputy associate administrator for Exploration System Development at NASA Headquarters in Washington. "This latest chapter builds on NASA's excellent relationship with ESA as a partner in the International Space Station, and helps us move forward in our plans to send humans farther into space than we've ever been before."

Above: As part of a new agreement between the two space agencies, the European Space Agency will provide the service module for NASA's Orion spacecraft. Image credit: NASA.

The agreement primarily maps out a plan for ESA to fulfill its share of operational costs and additional supporting services for the International Space Station by providing the Orion service module and necessary elements of its design for NASA's Exploration Mission-1 in 2017.

There are three major components to the Orion vehicle: the crew capsule, which will carry four astronauts into space on crewed flights and bring them home for a safe landing; the launch abort system, which would pull the crew module to safety in the unlikely event of a life-threatening problem during launch; and the service module, which will house Orion's power, thermal and propulsion systems. The service module is located directly below the crew capsule and will contain the in-space propulsion capability for orbital transfer, attitude control and high-altitude ascent aborts. It also will generate and store power and provide thermal control, water and air for the astronauts. It will remain connected to the crew module until just before the capsule returns to Earth.

"This is not a simple system" said Mark Geyer, Orion Program manager. "ESA's contribution is going to be critical to the success of Orion's 2017 mission."

Exploration Mission-1 in 2017 will be the first integrated flight test with both the Orion spacecraft and NASA's new Space Launch System (SLS). It will follow the upcoming Exploration Flight Test-1 in 2014, in which an uncrewed Orion will launch atop a Delta IV Heavy rocket and fly to an altitude of 3,600 miles above Earth's surface, farther than a human spacecraft has gone in 40 years. For the flight test, a test service module is being built by Lockheed Martin.

Exploration Mission-1 in 2017 will launch an uncrewed Orion spacecraft to demonstrate the performance of the

(Continued on page 43)

Above: JSC2013-E-004070 (16 Jan. 2013) Seated on the dais for a January 16, 2013, joint National Aeronautics and Space Administration/European Space Agency Orion Partnership News Conference at the NASA Johnson Space Center are (from left) Public Affairs Office (PAO) Moderator Brandi Dean; William Gerstenmaier, NASA Associate Administrator for Human Exploration and Operations; Thomas Reiter, ESA Director of Human Spaceflight and Operations; Mark Geyer, Orion Program Manager; and Bernardo Patti, ESA Manager of International Space StationOperations. Image credit: NASA.

(Continued from page 42)

integrated SLS rocket and the spacecraft prior to a crewed flight. It will be followed by Exploration Mission-2, which will launch Orion and a crew of four astronauts into space.

"We have a lot to look forward to in the coming years with human exploration," Dumbacher said. "NASA is thrilled to have ESA as a partner as we set out to explore our solar system."

The images below were selected by Philippe Mairet, 3AF MP and Douglas Yazell, AIAA Houston Section.

Above: Orion and the Orion ESA Service Module. Image source: ESA. Image credit: NASA.

Above: Orion and the Orion ESA Service Module. Image credit: ESA.

Above: This mosaic of images from the Envisat satellite presents a unified Europe seen from space. Image source: Techno-Science. Image credit: ESA.

Above: An aerial view of the complete NASA Johnson Space Center facility in Houston, Texas. A portion of Clear Lake can be seen at the top of the view. Image date: August 10, 1989. Image source: Wikipedia. Image credit: Great Images in NASA (GRIN).

Staying Informed

A question from the NASA/JSC press conference of January 16, 2013. (Image credit: NASA.) See our article later in this issue.

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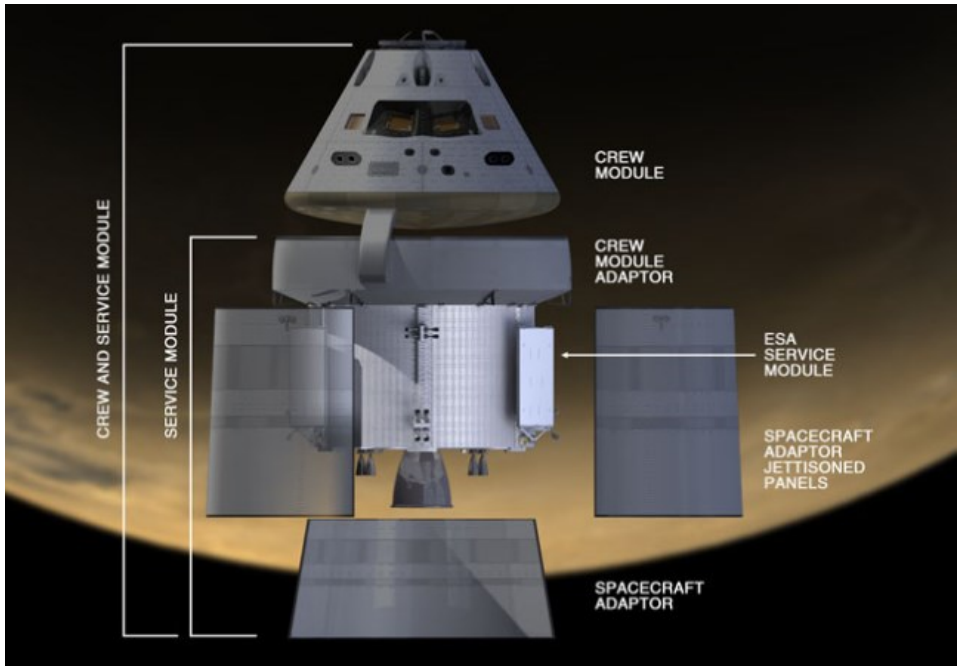

From Gina Sunseri of ABC News. "This questions is for Bill Gerstenmaier and for Mark Geyer: How tough is it to design a system like this when you don't know exactly where you are going? You know you can go to the [International] Space Station but you don't know if you are going to the Moon or Mars or an asteroid. Mark, when I interviewed you last year the plan was an asteroid. Well, how do you design a vehicle when you don't really know where it's going to go?"

Bill: "We have the basic requirements understood. We know what change in velocity or how much propellant this vehicle needs to carry. We know what its basic structural load capability is. We know how long the life support systems need to be there. We know how many crew we're going to carry. We know all of those parameters. You don't design a car to just go to the grocery store. You design a car that can go to the grocery store, go to the shopping mall, maybe drive across the country and do other things. It's the same kind of thing here. As engineers we take those basic requirements to do these multiple destinations, these multiple locations, and we're building a system that will allow us to go explore those. We no longer want to build a system that is optimized for one particular destination. We want a system that can actually push human presence out into the solar system and allow us to go to all of these different destinations. We broke it down into the requirements that allow us to capture all of these destinations, scarred some interfaces to grow a little bit in the area. The teams are very comfortable with what we laid out in front of them. They understand the requirements they need to build to."

Mark: "Bill said it great. This vehicle has lot of capability to do a lot of different missions. When you talk about volume and delta V and ability to carry crew it's really got a lot of flexibility. Do we participate in those architecture studies that happen at headquarters when they talk about new missions to make sure that we understand what, if any, updates we would need to make? [Yes.] Even at this point, with all of those different discussions, our plans with EM-1 and EM-2 have not changed because this is a very capable vehicle."

From http://collectSPACE.com:

February 20, 2013: Friendship 7 "found" in Texas: For at least the past four decades, a full-size model of a Mercury spacecraft has sat at the corner of Red Bluff Road and St. Augustine Avenue in Pasadena, Texas, located about 20 minutes from the Johnson Space Center. Sometime in the past few years, the capsule was repaired, restored and repainted, in the process gaining the logo of Friendship 7, John Glenn's capsule that he flew into orbit 51 years ago. *Image credit: collectSPACE.*

[Editor: I saw this from a distance recently as I drove by. I was tempted to return to report on this for Horizons and for my own curiosity. collectSPACE did a great job of reporting on this, but we all probably want to know even more about this mockup.]