Lockheed Martin-Built Huygens Instrument Takes Titanic Snapshots Of Saturn Moon

After over seven years in space, the European Space Agency's (ESA) Huygens probe has descended through the atmosphere of Titan, the largest of Saturn's multitude of moons. Pictures of Titan's exotic environment were provided by the Descent Imager/ Spectral Radiometer (DISR), a complex instrument designed and built by Lockheed Martin for the University of Arizona and the NASA Jet Propulsion Laboratory (JPL). NASA's Cassini spacecraft, with the Huygens probe in tow, was inserted into orbit around Saturn on June 30, 2004, initiating four years of orbital science investigations of the giant ringed planet and its many mysterious moons.

"We couldn't be more pleased for our colleagues at the University of Arizona, NASA and ESA as Huygens has allowed us unprecedented access to one of the most mysterious moons in the solar system," said James Crocker, vice president, Civil Space, at Lockheed Martin Space Systems Company. "The superb performance of the DISR hardware and the many years of hard work by the DISR team are equally gratifying, and we're proud to play a role in this exciting international voyage of exploration."

As Huygens descended by parachute through Titan's thick atmosphere, DISR made a range of imaging and spectral observations using several sensors and fields of view. The radiation balance of the atmosphere was measured by monitoring the upward and downward flow of radiation. A calculation of the size, number and density of suspended particles in the atmosphere was made possible by measuring the light intensity around the Sun. Two imagers (one visible, one infrared) observed the surface during the latter stages of the descent, and built up a mosaic of pictures around the touch down site. A side-view visible imager captured a horizontal view of the horizon and the underside of the cloud deck. The spectral measurements of the surface were enabled by a lamp that switched on shortly before touch down to augment the weak sunlight.

The study of Titan, Saturn's largest moon, is one of the major goals of the Cassini/Huygens mission. Although it is believed to be too cold to support life, haze-covered Titan may preserve, in deep-freeze, many of the same chemical compounds that preceded life on Earth. The Huygens descent and touch down is the most distant descent by a robotic probe ever attempted on another object in the solar system. Over the course of the orbital mission, Cassini will have executed 45 flybys of Titan, coming as close as approximately 590 miles (950 km) above the surface. This will permit high-resolution mapping of the moon's surface with an imaging radar instrument, which can see through the opaque haze of Titan's upper atmosphere.

The second largest planet in our solar system, after Jupiter, Saturn serves as a natural laboratory to better understand the formation of our Solar System five billion years ago, as the planet and its rings are a close analog to the disc of gas and dust surrounding the nascent Sun that formed the planets. Detailed knowledge of the dynamics of interactions among Saturn's elaborate rings and numerous moons will provide valuable data for understanding how each of the solar system's planets evolved.

The Cassini spacecraft was launched on a Lockheed Martin-built Air Force Titan IV/Centaur rocket Oct. 15, 1997. The Cassini propulsion module -- also built by Lockheed Martin -- is the largest U.S. planetary spacecraft propulsion system ever built, and was fired 17 times en route to Saturn, and will be ignited approximately 150 more times before the end of the mission. In addition to DISR, the Titan IV/Centaur and the propulsion system, Lockheed Martin Space Systems Company designed and built the three radioisotope thermoelectric generators (RTGs) that power spacecraft systems.

JPL designed, developed and assembled the Cassini orbiter. ESA managed the development of Huygens and is in charge of operations of the probe from its control center in Darmstadt, Germany. The Italian Space Agency provided the high-gain antenna, much of the radio system and elements of several of Cassini's science instruments. JPL manages the overall program for NASA's Office of Space Science, Washington, D.C.

Lockheed Martin Space Systems Company is one of the major operating units of Lockheed Martin Corporation. Space Systems designs, develops, tests, manufactures and operates a variety of advanced technology systems for military, civil and commercial customers. Chief products include a full-range of space launch systems, including heavy-lift capability, ground systems, remote sensing and communications satellites for commercial and government customers, advanced space observatories and interplanetary spacecraft, fleet ballistic missiles and missile defense systems.

Headquartered in Bethesda, Md., Lockheed Martin employs about 130,000 people worldwide and is principally engaged in the research, design, development, manufacture and integration of advanced technology systems,

products and services. The corporation reported 2003 sales of $31.8 billion.

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