# Third Pair Of Massive Lockheed Martin Solar Arrays Begin Providing Power To International Space Station

The third of four pairs of massive solar arrays and a second Solar Alpha Rotary Joint (SARJ), built by Lockheed Martin at its Space Systems facility in Sunnyvale, have been installed on the International Space Station by the crew of the space shuttle Atlantis. The two new solar arrays have been deployed and are generating electricity.

"It is a testament to the professionalism of the STS-117 crew and the mission support team that they made this difficult ISS construction project look easy, and the deployment of the new arrays was a sight to behold," said Brad Haddock, Lockheed Martin ISS program director. "To see our arrays producing electricity is wonderfully satisfying, and we're confident that this addition will further harness solar energy for the Space Station and provide the power required for many years to come."

The Space Systems ISS solar arrays are the largest deployable space structure ever built and are by far, the most powerful electricity-producing arrays ever put into orbit. When the Station is completed a total of eight flexible, deployable solar array wings will generate the reliable, continuous power for the on-orbit operation of the ISS systems. The eight array wings were designed and built under a $450 million contract from the Boeing-Rocketdyne Division in Canoga Park, Calif., for delivery to the Boeing Company and NASA.

Each of the eight wings consists of a mast assembly and two solar array blankets. Each blanket has 84 panels, of which 82 are populated with solar cells. Each panel contains 200 solar cells. The eight photovoltaic arrays thus accommodate a total of 262,400 solar cells. When fully deployed in space, the active area of the eight wings, each 107 by 38-feet, will encompass an area of 32,528-sq. ft., and will provide power to the ISS for 15 years.

A Solar Alpha Rotary Joint also built by Lockheed Martin, 10.5 ft in diameter and 40 inches long, was installed this week and will maintain the new solar arrays in an optimal orientation to the Sun while the entire space station orbits the Earth once every 90 minutes. Drive motors in the SARJ move the arrays through 360 degrees of motion at four degrees per minute. The joints must rotate the arrays smoothly without imparting vibrations to the laboratories and habitation modules on the station that would impact microgravity-processing activities. At the same time, 60 kW of power at 160 volts and multiple data channels are carried across each joint by copper "roll rings" contained within.

In addition to the arrays and SARJ, Space Systems in Sunnyvale designed and built other elements for the Space Station. The Thermal Radiator Rotary Joints (TRRJ) -- each five and a half feet long and three feet in diameter -- were launched in 2002. The two joints maintain Space Station thermal radiators in an edge-on orientation to the Sun that maximizes the dissipation of heat from the radiators into space.

Space Systems also produced the Trace Contaminant Control System -- launched to ISS as an element of the U.S. Destiny Laboratory module in 2001 -- an advanced air processing and filtering system that ensures that over 200 various trace chemical contaminants, generated from material off-gassing and metabolic functions in the Space Station atmosphere, remain within allowable concentration levels. It is an integral part of the Space Station's Cabin Air Revitalization Subsystem.

Lockheed Martin Space Systems Company (LMSSC) is a major operating unit of Lockheed Martin Corporation, designs, develops, tests, manufactures and operates a full spectrum of advanced-technology systems for national security, civil and commercial customers. Chief products include human space flight systems; a full range of remote sensing, navigation, meteorological and communications satellites and instruments; space observatories and interplanetary spacecraft; laser radar; fleet ballistic missiles; and missile defense systems.

Headquartered in Bethesda, Md., Lockheed Martin employs about 140,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2006 sales of $39.6 billion.

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