

# news

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**FOR IMMEDIATE RELEASE**  
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**RAVEN'S AEROSTAR SUBSIDIARY ANNOUNCES SUCCESSFUL FLIGHT OF NASA  
PROTOTYPE SUPER-PRESSURE BALLOON IN ANTARCTICA**

**SIoux FALLS, SD—January 16, 2009—**Aerostar International, Inc., a wholly-owned subsidiary of **Raven Industries, Inc. (Nasdaq NGS: RAVN)**, announced today a seven million cubic foot prototype super-pressure balloon, built for NASA's Balloon Program, has surpassed two weeks of near constant altitude flight over the Antarctic continent. This flight marks the next milestone in NASA's plans to develop a vehicle to fly heavy scientific payloads at the edge of space for periods up to 100 days.

The seven million cubic foot balloon, 274 feet in diameter, was built at Aerostar's facility in Sulphur Springs, Texas. The 1500 pound engineering test payload is equipped with GPS receivers, balloon instrumentation, satellite communications equipment, and cameras for monitoring the balloon's shape. This flight was preceded by another successful test flight of a two million cubic foot balloon, carried out in New Mexico in June of 2008.

NASA is developing a constant volume balloon that will eventually carry a payload of 6,000 pounds to 110,000 feet for up to 100 days. Unlike zero-pressure balloons, the current workhorses of the NASA Balloon Program, super-pressure balloons will have the ability to maintain very consistent altitudes under a variety of thermal conditions, including day and night transitions. Standard balloon designs vary in volume as they are heated and cooled by day-night cycles. In order to remain at a constant altitude, the super-pressure balloon must maintain a positive pressure relative to the outside air.

The design team, comprised of engineers from Aerostar, NASA, CSBF (Columbia Scientific Balloon Facility), and a team of international consultants developed a design capable of withstanding the stresses of maximum heating during the daytime while maintaining positive pressure during the cold night time. This is the largest super-pressure balloon ever flown

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## **Raven Industries, Inc.**

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successfully. The team is currently working on the next larger size in the design that will be flown later this year.

The current flight will verify the structural response of the balloon in the constant sunlight environment of the southern summer period over Antarctica. “The data obtained from this flight is crucial for our next steps in scaling up the design,” said Mike Smith, Senior Aerospace Engineer for Aerostar. “So far, the balloon performance is showing excellent agreement with the analytical models.” The traditional constant-pressure balloons being flown during the same campaign are experiencing altitude variations as much as 15,000 feet as the sun angle varies throughout the Antarctica day. The super-pressure balloon is experiencing altitude excursions of only a few hundred feet.

The benefits of the super-pressure design will allow scientific experiments to be conducted at altitudes above 99 percent of the atmosphere for durations approaching the capabilities of orbiting platforms. Scientific balloon missions can be planned and executed for a small fraction of the cost and time requirements of orbital missions. As an added benefit, balloon borne instruments are usually recovered, upgraded and flown on subsequent missions.

Real-time position data for the balloons currently flying over Antarctica can be viewed at [www.csbf.nasa.gov/antarctica/ice0809.htm](http://www.csbf.nasa.gov/antarctica/ice0809.htm)

### **About Aerostar International**

Aerostar International, Inc. is a wholly owned subsidiary of Raven Industries (**Nasdaq NGS: RAVN**), a U.S. manufacturer providing Aerospace Products, Military Products, Tethered Aerostats, Protective Wear and Custom Inflatables to various markets.

### **About Raven Industries, Inc.**

Raven is an industrial manufacturer that provides electronic precision-agriculture products, reinforced plastic sheeting, electronics manufacturing services, and specialty aerostats and sewn products to niche markets.

**On the Internet, information is available at [www.aerostar.com/aerospace.htm](http://www.aerostar.com/aerospace.htm), and the company’s website, [www.ravenind.com](http://www.ravenind.com).**