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### Aerostar Balloon Sets new NASA Endurance Record

A giant stratospheric balloon manufactured in Texas has helped NASA’s Balloon Program set another endurance record for large scientific payloads. The forty million cubic foot balloon carried the 6,000–pound CREAM (Cosmic Ray Energetics And Mass) experiment to an altitude of 130,000 feet for almost forty–two days. Launched from the McMurdo Station, Antarctica on December 16, 2004, the balloon circled the continent three times to return its payload 410 miles from its launch point.

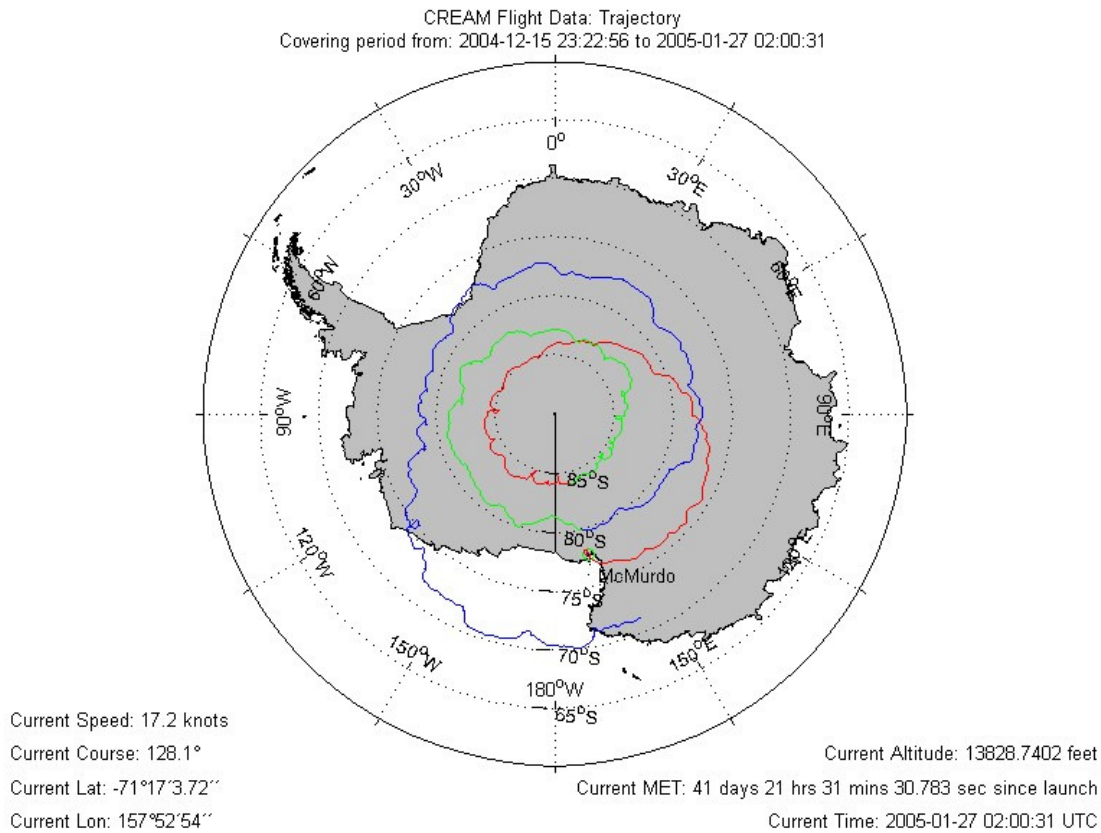


Figure 1 - The CREAM flight track shows three circumnavigations of Antarctica

As part of the LDB (Long Duration Balloon) project, engineers, scientists, meteorologists, and launch crew technicians travel to Antarctica to take advantage of the unique set of conditions that allow balloons to fly for long durations in the stratosphere. The two ingredients are a persistent polar circulation around a nearly stationary stratospheric high pressure system in the Austral summer and constant sunlight which allows the balloon to maintain an almost constant altitude.

The balloon was designed and manufactured at Aerostar's stratospheric balloon manufacturing facility in Sulphur Springs, Texas. The balloon's launch crew was from the National Scientific Balloon Facility (NSBF) in Palestine, Texas.

Danny Ball, the NSBF's manager said, "Special congratulations should go to the Aerostar crew for building what is perhaps the best balloon ever. Balloon performance has been such that no one can argue that this was a perfect balloon."

"We are excited with the duration of this flight, which allowed scientists to get ample data to perform their studies," said David Pierce, Chief of the Balloon Program Office at NASA's Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Va. "We routinely have long duration balloons that float for up to two weeks, but to have one flight last more than 41 days is very rewarding," he added.

Long duration scientific flights above 99.9% of the Earth's atmosphere allow scientists to observe extremely high energy cosmic ray particles. Some of these particles are so rare that they have a density of one per square meter per century. These particles provide valuable data in understanding the structure of the universe on a cosmological scale as well as the subatomic scale. The longer the balloon flies, the more likely the science team is to have the opportunity to observe one of these very rare particles.

In a continuing effort by NASA to extend stratospheric balloon technology, Aerostar is has partnered with the NSBF and NASA to develop the Ultra Long Duration Balloon (ULDB). The ULDB system will provide mission durations of up to three months without the need to travel to ends of the Earth to conduct flight operations in constant sunlight. Development of the ULDB has progressed at a steady pace over the last year and a prototype balloon is currently awaiting a test flight at the NASA launch facility in Fort Sumner, NM. Once operational, the ULDB will provide space science opportunities what were once only available on orbital missions costing thousands hundreds of times more. Balloon missions offer the added advantage of

returning the instrument to the science team for refurbishment and re-flight on a later mission.

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For information about NASA's Scientific Balloon Program on the Internet, visit:

<http://www.wff.nasa.gov/~code820/>

For pictures and information on the CREAM mission on the Internet, visit:

<http://cosmicray.umd.edu/cream/CREAMflight.htm>