

## 2003 Genesis Mission Status Updates: January, February, March

### March 21, 2003

Like a fine chronograph that it somewhat resembles, Genesis continues ticking along and is in overall good health. As of the morning of March 21, the spacecraft was about 1.640 million kilometers (1.02 million miles) from Earth.

While the Genesis spacecraft's primary job is to bask in the warm rays of Earth's most brilliant celestial neighbor, those members of its support team residing in the Mile High city may think the 7.9-meter (26-foot) long spacecraft is getting more than its fair share.



Genesis team member Angus McMechan sometimes has to dig living in Denver.

### March 14, 2003

The Genesis spacecraft continues to operate in overall good health. It has collected solar wind material expelled from the Sun for almost 15 months.

Over this past week, the spacecraft's 'low solar speed' collector array has been logging the majority of collection time. There are three collector arrays aboard Genesis that are exposed to or hidden from the solar wind, one for each of the three solar wind regimes. Which collector array is exposed is determined by the data received by sensitive ion and electron monitors located on the spacecraft's equipment deck. These monitors scrutinize the solar wind passing by the spacecraft and relay this information to the onboard computer, which in turn commands the collector arrays to deploy and retract as needed.

Genesis Vital Statistics:

- 583 days since launch.
- 387 days to planned completion of solar particle collection.
- 544 days to Genesis return to Earth.

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### February 28, 2003

Having passed mission midpoint the previous week, the Genesis spacecraft continues to operate in overall good health as it soldiers on collecting solar wind material expelled from the Sun.

Telemetry from the Genesis spacecraft indicates that it is spinning at a rate of 1.598 rotations per minute. The spacecraft's space age 'gas gauge' indicates propellant usage averages out to 1.75 grams (0.0617284 ounces) of hydrazine a day.

Genesis Vital Statistics:

## **2003 Genesis Mission Status Updates: January, February, March**

- 568 days since launch.
  - 401 days to planned completion of solar particle collection.
  - 559 days to Genesis return to Earth.
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### **February 24, 2003**

Genesis hits halfway mark!

Genesis has passed the midpoint of its record setting solar sample return mission. As of today, the Genesis spacecraft has logged 565 days in space and has only 562 days remaining until Earth return. Passing through this milestone, Genesis continues to operate in overall good health as it continues its mission collecting solar wind material expelled from the Sun.

Telemetry from the Genesis spacecraft indicates that it is spinning at a rate of 1.600 rotations per minute. The spacecraft's space age gas gauge indicates propellant usage totals are 16.41 kilograms (36.17 pounds).

Genesis Vital Statistics:

565 days since launch.

404 days to planned completion of solar particle collection.

562 days to Genesis return to Earth.

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### **February 18, 2003**

The Genesis spacecraft continues its mission collecting solar wind material expelled from the Sun. Telemetry from the Genesis spacecraft indicates that it is spinning at a rate of 1.602 rotations per minute and in overall good health.

A review of the Sample Return Capsule Avionics Unit was held on Monday, Feb. 10. Among the items addressed during the meeting, the Genesis team established 80 degrees Celsius as the 'flight allowable temperature' for Sample Return Capsule Avionics Unit. Essentially, they established 80 degrees Celsius as a tripwire for the Sample Return Capsule Avionics Unit. If the avionics unit reaches this temperature mark, the Genesis team is notified.

Genesis performed a stationkeeping maneuver this past Feb. 4. The maneuver, or burn, tweaked the spacecraft's trajectory around the Lagrange 1 point of gravitational stability between Earth and the Sun. The burn employed the spacecraft's small hydrazine thrusters. Telemetry indicates there was a very slight underburn but that the maneuver resulted in the desired change in trajectory.

Genesis Vital Statistics:

-- 559 days since launch.

## **2003 Genesis Mission Status Updates: January, February, March**

- 410 days to planned completion of solar particle collection.
  - 568 days to Genesis return to Earth.
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### **February 3, 2003**

The Genesis spacecraft continues its mission and is in overall good health, collecting solar wind material expelled from the Sun.

Genesis team members are analyzing telemetry from the Jan. 28 concentrator rejection grid test. The Genesis concentrator grid carries a positive charge in order to deflect hydrogen ions while allowing heavier oxygen ions to pass through. That concentrates oxygen, in proportion to hydrogen, reaching the collector tile. The concentrator rejection test indicated a very slight drop in the concentrator grid's maximum voltage, from 2100 volts to 2080 volts.

Genesis team members are also putting the finishing touches to the inflight program that will be uplinked for the Feb. 4 stationkeeping maneuver. This maneuver, or burn, will tweak the spacecraft's trajectory around the Lagrange 1 point of gravitational stability between Earth and the Sun. The burn will employ the spacecraft's small hydrazine thrusters and alter Genesis' velocity by all of 1.77 meter per second (3.96 miles per hour).

Genesis Vital Statistics: n 535 days since launch.  
n 434 days to planned completion of solar particle collection.  
n 592 days to Genesis return to Earth.

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### **January 24, 2003**

The Genesis spacecraft continues to operate in good health, collecting samples of the solar wind.

The flight team is preparing for the spacecraft's next stationkeeping maneuver, scheduled for Feb. 6. These maneuvers fine-tune the orbit Genesis is traveling around the L1 point. The upcoming one is being designed to accelerate the spacecraft by about 1.2 meters per second (3.9 feet per second) in a direction about 24 degrees off a line toward the Sun.

Plans are nearly final for a performance test of the rejection grid on the sample concentrator. The test is planned for Jan. 28.

The Genesis team was saddened this week by news of the death of Vern Lunsford in an avalanche in British Columbia, Canada. He was an engineer at Lockheed Martin Astronautics who designed many mechanisms on the spacecraft's sample-return capsule.

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## **2003 Genesis Mission Status Updates: January, February, March**

### **January 20, 2003**

The Genesis spacecraft continues its mission collecting solar wind material expelled from the Sun. Telemetry from the Genesis spacecraft indicates that it is spinning at a rate of 1.594 rotations per minute and in overall good health.

Over this past week, the spacecraft's 'low solar speed' collector array has been logging the majority of collection time. There are three collector arrays aboard Genesis that are exposed to or hidden from the solar wind, one for each of the three solar wind regimes. Which collector array is exposed is determined by the data received by sensitive ion and electron monitors located on the spacecraft's equipment deck. These monitors scrutinize the solar wind passing by the spacecraft and relay this information to the onboard computer, which in turn commands the collector arrays to deploy and retract as needed.

#### Genesis Vital Statistics:

- 530 days since launch.
  - 439 days to planned completion of solar particle collection.
  - 597 days to Genesis return to Earth.
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### **January 13, 2003**

The Genesis team is back at the helm after a well deserved holiday. They returned to find their spacecraft continuing its mission collecting solar wind material expelled from the Sun. Telemetry from the Genesis spacecraft indicates that it is spinning at a rate of 1.595 rotations per minute and in overall good health.

#### Genesis Vital Statistics:

- 523 days since launch
- 446 days to planned completion of solar particle collection
- 604 days to Genesis return to Earth