

2002 Genesis Mission Status Updates: January, February, March

March 28, 2002

All of Genesis' subsystems are performing normally, which adds up to a good week for the spacecraft.

A software patch to improve the WIND algorithm's selection of the correct wind regime was successfully loaded on board this week.

Analysis of results from last week's station keeping maneuver SKM-1C by the navigation and ACS teams indicates that the spacecraft executed the maneuver within 1% of the intended change.

The propulsion system has used a total of 13.1 kg of fuel over the life of the mission, and has used 1.8 kg of fuel since the start of science sample collection.

The Deep Space Network's new command system tested successfully this week, sending two commands to Genesis, and verifying that the spacecraft received them correctly.

February 27, 2002

Things have been relatively quiet with the spacecraft over the last week. All subsystems are performing normally.

The two software patches are in the final stages of development and testing. They are scheduled to be uplinked on March 12th.

The propulsion system is nominal; 1.1 kg of fuel have been used since the start of the science collection, 12.4 kg of fuel has been used since launch.

Science collection continues as usual. Plans are being finalized to perform tests every three months on the concentrator rejection grid to confirm its capability.

Background sequence gs015, which goes active on March 12th, will include a retransmit block, instead of line-by-line retransmit commands. With this addition, the background sequences can now last 28 or more days. Also, a station keeping maneuver block has been developed to allow SKM's to be more autonomous and to restart science collection more quickly.

February 19, 2002

Genesis' subsystems are all performing normally.

A patch to EEPROM (programmable memory) was installed on Saturday to correct a single bit. A load 'n' go sequence was developed to set EEPROM's write speed to high (fly-as-you-test reasons), load the two patch files, and set the write speed back to low.

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EEPROM writing was enabled for about 2.1 seconds, though the actual write took much less time.

A check performed after the write showed a successful load, with the bit still needing correction. The patch, which cleverly included only 28 bytes of code and data, was quickly developed without deviating from our standard process and controls. Again note that this one bit does NOT indicate a global problem.

The flight software group spearheaded the EEPROM patch design and development. They are also making two science-related patches, one to provide adjustable rejection grid voltage steps, and the other to change the alpha weight factor to fix entry into the coronal mass ejection regime.

The good news for us is that the solar wind collection continues with no unplanned interruptions.

January 17, 2002

The second station keeping maneuver, SKM-1B, was successfully executed yesterday at high noon Mountain Time. The burn, which took about 282 seconds, was accurate to about 0.1 degree. Following this, star tracker images were taken for trending purposes. Initially, it seems that this maneuver was even better than the already good SKM-1A. SKM-1C is scheduled for mid-March.

This morning, a rejection grid test was performed with somewhat surprising results: The rejection grid was stepped up in 20-volt increments from 1500 to 1620 volts, and performed well. Previously, we had only been able to take the rejection grid up to about 1540 volts (while stepping up in larger increments). Next week, we will do more tests to see if we can now raise the software limit on the rejection grid.

We had three different solar wind regimes over the last week. We had a high-speed coronal mass ejection followed by high-speed wind. Now slow (interstream) solar wind is probably passing by the spacecraft. Science has reported that everything is going swimmingly.

January 3, 2002

The spacecraft has been quietly collecting science over the holiday break. We had a solar proton storm on December 26 and a high-speed solar stream on December 31, both of which were weathered well (there's a pun there somewhere).

There was a high-speed solar wind stream, over 700 kilometers per second (1.5 million miles per hour) on December 31. Because of this, the electrode mirror voltage correctly went the highest it's been since checkout, 10 kilovolts. A few arcs were noted, but these

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were expected. Since the leading edge of the stream was relatively hot, the rejection grid voltage correctly went to zero volts and then up to 1500 volts during the event.

Daily precessions continued over the break. The spacecraft is still spinning at 1.6 revolutions per minute. The second station-keeping maneuver, 1B, is scheduled for January 16th. The sample return capsule's battery is now at 32 degrees Celsius, increasing about 0.2 degrees Celsius per day, and following the curve as we expected.