

NASA to check on Rover Spirit during Martian spring

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An artist's concept portrays a NASA Mars Exploration Rover on the surface of Mars. Two rovers have been built for 2003 launches and January 2004 arrival at two sites on Mars. Each rover has the mobility and toolkit to function as a robotic geologist. Credit: NASA/JPL/Cornell University

(PhysOrg.com) -- Nine months after last hearing from the Mars rover Spirit, NASA is stepping up efforts to regain communications with the rover before spring ends on southern Mars in mid-March.

Spirit landed on [Mars](#) Jan. 4, 2004 (Universal Time; Jan. 3, Pacific Time) for a mission designed to last for three months. After accomplishing its prime-mission goals, Spirit worked for more than five years in bonus-time extended missions.

"The amount of solar energy available for Spirit is still increasing every day for the next few months," said [Mars Exploration Rover](#) Project Manager John Callas of NASA's Jet Propulsion Laboratory, Pasadena, Calif. "As long as that's the case, we will do all we can to increase the chances of hearing from the rover again."

After mid-March, prospects for reviving Spirit would begin to drop. Communication strategies would change based on reasoning that Spirit's silence is due to factors beyond just a low-power condition. Mission-ending damage from the cold experienced by Spirit in the past Martian winter is a real possibility.

The rover's motors worked far beyond their design life, but eventually, Spirit lost use of drive motors on two of its six wheels. This left it unable to obtain a favorable tilt for solar energy during the rover's fourth Martian winter, which began last May.

Spirit and its twin, Opportunity, which landed three weeks after Spirit and is still active, both have made important discoveries about wet environments on [ancient Mars](#) that may have been favorable for supporting [microbial life](#).

Spirit last communicated on March 22, 2010. The rover team had anticipated that the rover would enter a low-power fault mode with minimal activity except charging and heating the batteries and keeping its clock running. With most heaters shut off, Spirit's internal temperatures dipped lower than ever before on Mars. That stress could have caused damage, such as impaired electrical connections, that would prevent reawakening or, even if Spirit returns to operation, would reduce its capabilities.

Southern-Mars spring began in November 2010. Even before that, NASA's Deep Space Network of antennas in California, Spain and

Australia has been listening for Spirit daily. The rover team has also been sending commands to elicit a response from the rover even if the rover has lost track of time.

Now, the monitoring is being increased. Additional listening periods include times when Spirit might mistake a signal from NASA's Mars Reconnaissance Orbiter as a signal from Earth and respond to such a signal. Commands for a beep from Spirit will be sent at additional times to cover a wider range of times-of-day on Mars when Spirit might awaken. Also, NASA is listening on a wider range of frequencies to cover more possibilities of temperature effects on Spirit's radio systems.

Provided by JPL/NASA

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