

# Mars Rover Team Diagnosing Unexpected Behavior

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Artist's concept of Mars Exploration Rover. Image credit: NASA/JPL-Caltech/Cornell University

(PhysOrg.com) -- The team operating NASA's Mars Exploration Rover Spirit plans diagnostic tests this week after Spirit did not report some of its weekend activities, including a request to determine its orientation after an incomplete drive.

On Sunday, during the 1,800th Martian day, or sol, of what was initially planned as a 90-sol mission on Mars, information radioed from Spirit indicated the rover had received its driving commands for the day but had not moved. That can happen for many reasons, including the rover properly sensing that it is not ready to drive. However, other behavior on Sol 1800 was even more unusual: Spirit apparently did not record the day's main activities into the non-volatile memory, the part of its memory that persists even when power is off.

On Monday, Spirit's controllers at NASA's Jet Propulsion Laboratory in Pasadena, Calif., chose to command the rover on Tuesday, Sol 1802, to find the sun with its camera in order to precisely determine its orientation. Not knowing its orientation could have been one possible explanation for Spirit not doing its weekend drive. Early Tuesday, Spirit reported that it had tried to follow the commands, but had not located the sun.

"We don't have a good explanation yet for the way Spirit has been acting for the past few days," said JPL's Sharon Laubach, chief of the team that writes and checks commands for the rovers. "Our next steps will be diagnostic activities."

Among other possible causes, the team is considering a hypothesis of transitory effects from cosmic rays hitting electronics. On Tuesday, Spirit apparently used its non-volatile memory properly.

Despite the rover's unexplained behavior, Mars Exploration Rovers' Project Manager John Callas of JPL said Wednesday, "Right now, Spirit is under normal sequence control, reporting good health and responsive to commands from the ground."

Provided by JPL

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