

NASA's Mars helicopter Ingenuity needs a patch to keep flying after sensor failure

June 8 2022, by Bob Yirka



Ingenuity at Airfield D: This image of NASA's Ingenuity Mars Helicopter was taken by the Mastcam-Z instrument of the Perseverance rover on June 15, 2021, the 114th Martian day, or sol, of the mission. The location, "Airfield D" (the fourth airfield), is just east of the "Séítah" geologic unit. Credit: NASA/JPL-Caltech/ASU/MSSS.

NASA's Mars helicopter Ingenuity has suffered a sensor failure, according to Håvard Grip, the chief helicopter pilot on the project. In a recent [blog post](#) on the NASA Science page, he described some of the challenges the tiny robot is experiencing in the harsh environment and also noted that a sensor failure is going to require a computer patch.

Ingenuity has been on Mars since February 2021, along with the Perseverance rover. Since that time, it has flown 28 times, significantly more than was originally planned. Its initial assignment was to determine if a helicopter could be flown on Mars. Ingenuity has shown that it can—and far more. Its current missions generally entail surveying the landscape around Perseverance, helping to plot its course.

But the [harsh environment](#) on Mars has posed challenges for the tiny helicopter and the crew working to keep it flying. First of all, according to Grip, since the helicopter was not expected to last as long as it did, measures were not taken to ensure it could get enough power from the sun during the short Martian winter days. Thus, it has to shut down at night. That leaves it exposed to temperatures as low as -80 degrees Celsius, which could lead to damage of its electronics. And the constant shift in [temperature extremes](#) could lead to damage as well. The helicopter, along with every other [vehicle](#) sent to Mars, also has to contend with constant dust, which is even more prevalent in the winter.

Ingenuity has held up remarkably well despite these conditions, Grip notes. However, a sensor called the inclinometer has stopped working. While not needed for [flight](#), it is needed to orient the helicopter prior to lifting off. Grip notes that the team that designed Ingenuity took this possibility into consideration and developed a patch to solve the problem before the helicopter ever got to Mars. The patch is meant to use information from other sensors and essentially fool the helicopter into thinking it is getting the data from the inclinometer. He notes that the [patch](#) will be sent and installed soon, and he expects Ingenuity to resume

flight shortly thereafter.

More information: [mars.nasa.gov/technology/helic ... -with-a-dead-sensor/](https://mars.nasa.gov/technology/helic...-with-a-dead-sensor/)

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