

Ingenuity Mars helicopter completes first one-way trip

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NASA's Ingenuity Mars Helicopter's fifth flight was captured on May 7, 2021, by one of the navigation cameras aboard the agency's Perseverance rover. The helicopter ascended to a new height record of 33 feet (10 meters) flew 424 feet (129 meters) to a new landing site. This was the first time the helicopter made a one-way flight. It was airborne a total of 108 seconds. Credit: NASA/JPL-Caltech

NASA's Ingenuity Mars Helicopter completed its fifth flight on the Red

Planet today with its first one-way journey from Wright Brothers Field to an airfield 423 feet (129 meters) to the south. After arrival above its new airfield, Ingenuity climbed to an altitude record of 33 feet (10 meters) and captured high-resolution color images of its new neighborhood before touching down.

The flight represents the rotorcraft's transition to its new operations demonstration phase. This phase will focus on investigating what kind of capabilities a rotorcraft operating from Mars can provide. Examples include scouting, aerial observations of areas not accessible by a rover, and detailed stereo imaging from atmospheric altitudes. These operations and the lessons learned from them could significantly benefit future aerial exploration of Mars and other worlds.

"The fifth flight of the Mars Helicopter is another great achievement for the agency," said Bob Pearce, associate administrator for NASA's Aeronautics Research Mission Directorate. "The continuing success of Ingenuity proves the value of bringing together the strengths of diverse skill sets from across the agency to create the future, like flying an aircraft on another planet!"

The flight began at 3:26 p.m. EDT (12:26 p.m. PDT, 12:33 p.m. local Mars time) and lasted 108 seconds. The Ingenuity team chose the new landing site based on information gathered during the previous flight—the first "aerial scout" operation on another world—which enabled them to generate digital elevation maps indicating almost completely flat terrain with almost no obstructions.

"We bid adieu to our first Martian home, Wright Brothers Field, with grateful thanks for the support it provided to the historic first flights of a planetary rotorcraft," said Bob Balaram, chief engineer for Ingenuity Mars Helicopter at JPL. "No matter where we go from here, we will always carry with us a reminder of how much those two bicycle builders

from Dayton meant to us during our pursuit of the first flight on another world."



NASA's Ingenuity Mars Helicopter's was captured after landing on May 7, 2021, by the Mastcam-Z imager, one of the instruments aboard the agency's Perseverance rover. The helicopter ascended to a new height record of 33 feet (10 meters) and flew 424 feet (129 meters) to a new landing site. This was the helicopter's fifth flight, and the first time the helicopter made a one-way flight. It was airborne a total of 108 seconds. Credit: NASA/JPL-Caltech/ASU/MSSS

The Wright brothers went on from proving powered, controlled flight was possible to attempting to better understand how the new technology could be employed. In a similar fashion, NASA seeks to learn more with

Ingenuity how operations with next-generation helicopters could benefit future exploration of the Red Planet. This new phase will bring added risk to Ingenuity, with more one-way flights and more precision maneuvering.

Having successfully landed at its new airfield, Ingenuity will await future instructions, relayed via Perseverance, from mission controllers. The agency's fifth rover to the fourth planet is also heading south, toward a region where it will commence science operations and sample collection. The rover team's near-term strategy doesn't require long drives that would leave the helicopter far behind, allowing Ingenuity to continue with this operations demonstration.

"The plan forward is to fly Ingenuity in a manner that does not reduce the pace of Perseverance science operations," said Balaram. "We may get a couple more flights in over the next few weeks, and then the agency will evaluate how we're doing. We have already been able to gather all the [flight](#) performance data that we originally came here to collect. Now, this new operations demo gives us an opportunity to further expand our knowledge of flying machines on other planets."

Provided by Jet Propulsion Laboratory

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