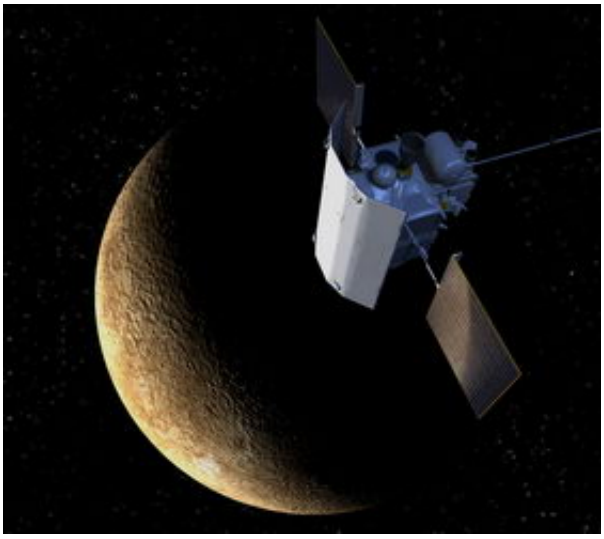
Mercury Messenger Probe Flips Sunshade Towards The Sun

June 23 2006



This artist's impression shows NASA&acutes Mercury-bound MESSENGER from the sunshade side. The sunshade shields the spacecraft's instruments from heat and solar radiation. Image Credit: Johns Hopkins University Applied Physics Laboratory

The Messenger spacecraft performed its final "flip" maneuver for the mission on June 21. Responding to commands sent from the Messenger Mission Operations Center at The Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md., through NASA's Deep Space Network antenna station near Goldstone, Calif., the spacecraft rotated 180 degrees, pointing its sunshade toward the Sun.

The 16-minute maneuver, designed to keep Messenger operating at safe temperatures as it moves closer to the Sun, wrapped up at 9:34 a.m. EDT, with successful reacquisition of signal from Messenger's front-side antenna.

The spacecraft was 196.5 million kilometers (122.1 million miles) from Earth and 144.6 million kilometers (89.8 million miles) from the Sun when the maneuver occurred.

Messenger had been flying with its back to the Sun since a March 8 "flop," allowing it to maintain temperatures within safe operating ranges at Sun distances greater than 0.95 astronomical units (1 AU is Earth's distance from the Sun).

Mission plans call for the spacecraft to keep its sunshade facing the Sun for the remainder of its cruise and science orbital operations around Mercury.

"Initial indications look very good" says Messenger Mission Operations Manager Mark Holdridge, of APL. "Spacecraft temperatures are coming down as expected and all systems and instruments are nominal."

The team will now turn its attention to preparing for the first Venus flyby on October 24. "We have mission simulations and flight tests coming up to test particular operations that will have to occur during the Venus flyby," Holdridge says.

"There will be a 57-minute solar eclipse during the October operation, so we will so be testing the flight systems in the flyby configuration to verify they will behave properly during the eclipse period."

On August 11, for instance, the team will conduct a flight test of the new autonomy that will power off components prior to the solar eclipse,

allow the battery to discharge by approximately the same amount as during the real eclipse, and then power on components again once the battery is recharged, all in a more controlled setting with real-time visibility. This test will be combined with a battery reconditioning.

Later in August and through September, during the approach to Venus, Messenger's navigation team will use the Mercury Dual Imaging System cameras onboard the spacecraft to take a series of optical navigation pictures.

These images are not required for the Venus flyby but will be used by the Messenger navigation team for calibration and as practice for the optical navigation imaging to be utilized at Mercury.

Mercury Science: From Mariner 10 to Messenger

It takes hard work and the dedication of scores of individuals to make Messenger run smoothly — and through the remainder of the mission we'll introduce you to the Instrument, Engineering and Science Team members who make this mission happen.

First up is Robert G. Strom, a founder of modern planetary geology, an expert in surface morphology, and the only person on the Messenger team to have also served on the first mission to Mercury, Mariner 10.

As a member of the Science Team's Geology Group, he will lead the analysis of Mercury's geologic history and participate in the analysis of Mercury Atmospheric and Surface Composition Spectrometer spectral measurements of the surface.

Source: Johns Hopkins University Applied Physics Laboratory