

CNET News

[The Space Shot](#)

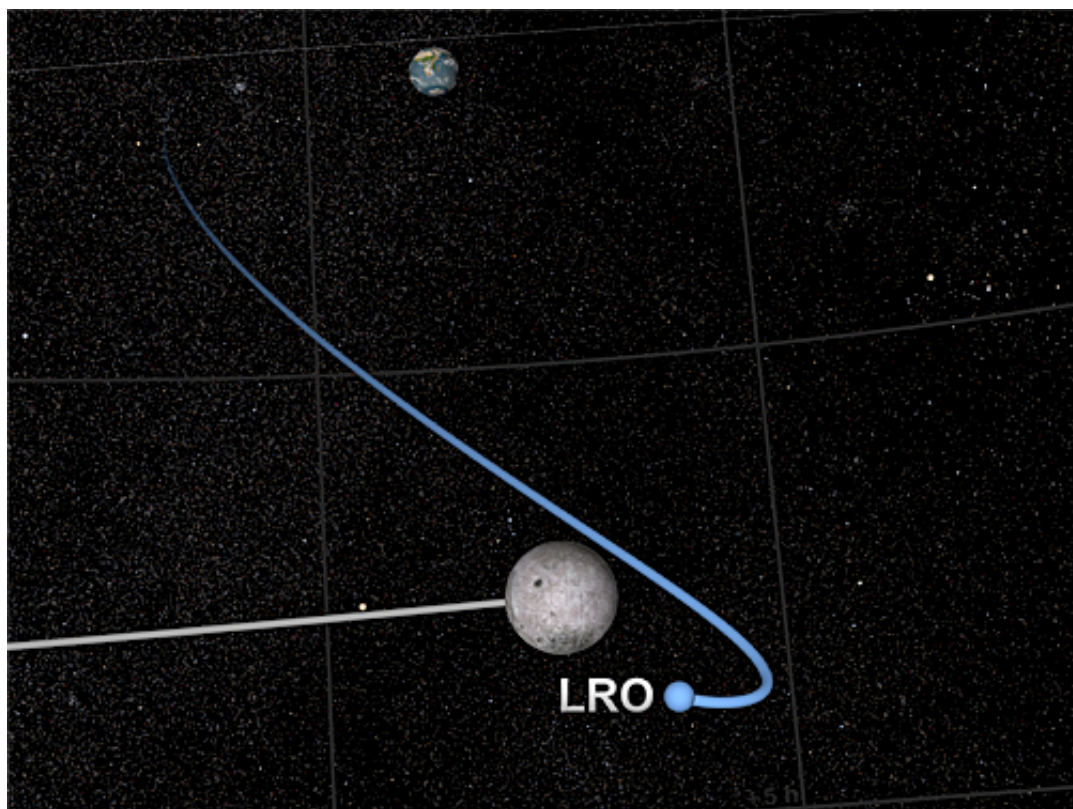
June 23, 2009 9:31 AM PDT

Lunar satellite slips into orbit with 40-minute 'burn'

by [William Harwood](#)

Four-and-a-half days after launch, NASA's \$504 million Lunar Reconnaissance Orbiter fired its main thrusters for 40 minutes early Tuesday, successfully braking into an initially elliptical orbit around the moon.

The critical rocket firing began around 5:47 a.m. EDT and ended as planned at 6:27 a.m., putting the spacecraft into an orbit tilted 30 degrees from the moon's poles with a low point of 136 miles and a high point of 1,926 miles.



A graphic showing LRO's path to the moon and the result of a 40-minute

rocket firing Tuesday that slowed the craft enough for capture by the moon's gravity.

(Credit: NASA)

"All stations, this is flight," said lead flight director Rick Saylor. "Congratulations on a successful LOI (lunar orbit insertion) to return NASA to the moon."

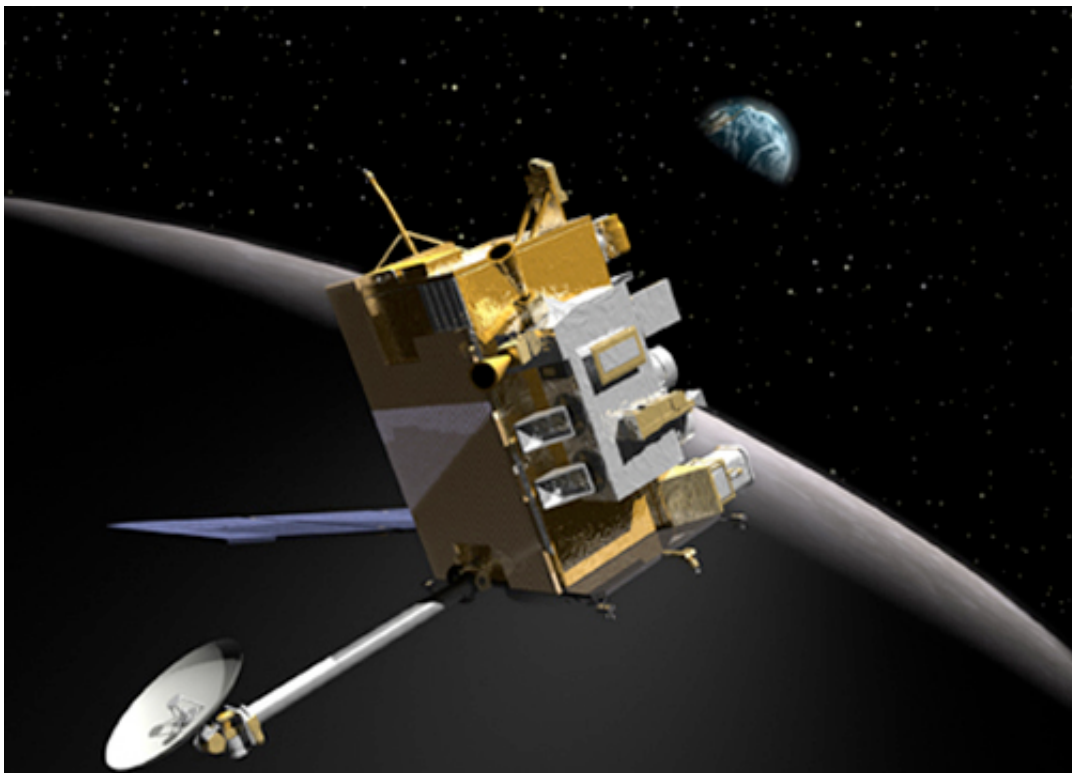
Over the next five days, the Lunar Reconnaissance Orbiter will carry out four additional rocket firings to put the spacecraft in its so-called commissioning orbit with a low point of just 18.5 miles above the moon's south pole and a high point of 134 miles above the north pole. The orbit eventually will be circularized at about 31 miles above the moon.

"The tracking shows we're essentially where we planned to be, we're at the moon," said Craig Tooley, the LRO project manager at NASA's Goddard Space Flight Center. "It went like clockwork. With a mission like this, we spent literally years practicing for every possible contingency to be ready for this. In the end, it went exactly as planned."

LRO will spend two months in its commissioning orbit for instrument checkout and calibration before maneuvering into the desired 31-mile-high mapping orbit.

Equipped with seven state-of-the-art cameras and other instruments, LRO will look for suitable landing sites for future manned missions while creating the most detailed lunar atlas ever assembled.

The two-ton solar-powered spacecraft also will measure the solar and cosmic radiation that future lunar explorers will face and map out the surface topology, mineralogy, and chemical composition of Earth's nearest neighbor. One year will be spent scouting future landing sites followed by three years of purely scientific observations.



A NASA graphic showing the Lunar Reconnaissance Orbiter in orbit around the moon.

(Credit: NASA)

"Over the course of an entire year...we will have a global measurement of the moon and have a new set of data, essentially a new atlas of the moon that has not only measurements of topology and temperature but minerals and then global images of the moon," LRO project scientist Rich Vondrak said before launch.

"One of our primary objectives is to identify safe landing sites for future human return to the moon. The Apollo program accepted risk and was able to have safe landings. We want to return to the moon, make repeated landings in some areas and be able to go there with a higher degree of safety."

Using the data collected by LRO, he said, "we'll get new views of the moon and we will prepare for the next generation of explorers and scientists the handbook, the guidebook for future exploration of the moon."

LRO was launched by an Atlas 5 rocket from the Cape Canaveral Air Force Station last Thursday along with a companion spacecraft, the \$79 million Lunar Crater Observation and Sensing Satellite, or LCROSS. The two spacecraft separated shortly after launch.

LCROSS is designed to guide the Atlas 5's spent Centaur second stage to an impact in a permanently shadowed crater near the moon's south pole on October 9. Instruments aboard LCROSS, LRO, the Hubble Space Telescope and at observatories on Earth will study the debris thrown up by the crash to look for evidence of ice, a critical resource for future outposts.

Updated at 2:40 p.m. EDT: *Adding the name of the LRO flight director.*



William Harwood has been covering the U.S. space program full-time since 1984, first as Cape Canaveral bureau chief for United Press International and now as a consultant for CBS News. He has covered more than 115 shuttle missions, every interplanetary flight since Voyager 2's flyby of Neptune, and scores of commercial and military launches. Based at the Kennedy Space Center in Florida, Harwood is a devoted amateur astronomer and co-author of "Comm Check: The Final Flight of Shuttle Columbia."