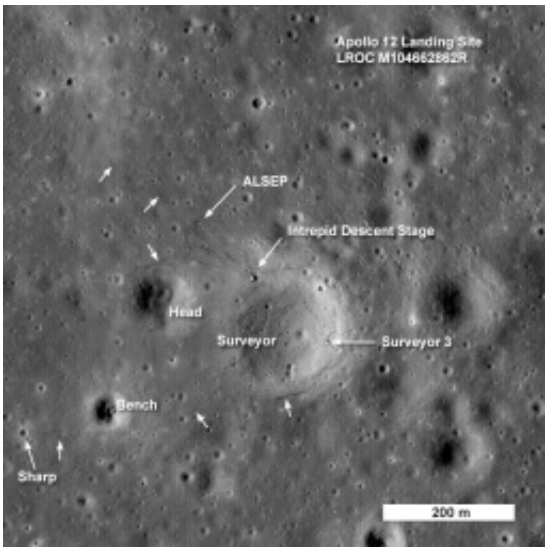

The Surveyor 3 spacecraft, Lunar Module descent stage, and Apollo Lunar Surface Experiment Package (ALSEP) along with astronaut tracks are all visible in this image of the Apollo 12 landing site. Credit: NASA/GSFC/Arizona State University Download image

LRO camera takes first look at Apollo 12 landing site

Just over a month ago, the imaging system on board NASA's Lunar Reconnaissance Orbiter (LRO) had its first of many opportunities to photograph five of the six Apollo landing sites. The LROC (short for Lunar Reconnaissance Orbiter Camera) team recently had the chance to target the remaining landing site.

The Apollo 12 landing site was well worth the wait. The Surveyor 3 spacecraft, Lunar Module descent stage and Apollo Lunar Surface Experiment Package (ALSEP), along with astronaut tracks, are all visible.

Mark Robinson, principal investigator of LROC and professor in the School of Earth and Space Exploration in the College of Liberal Arts and Sciences, provides a historical backdrop to the recently returned image:

After the great success of Apollo 11, NASA's next step was honing the Lunar Module's (LM) ability to make a pinpoint landing. Many of the future landing sites corresponded to areas with rough topography; the LM would have to come in steeply and set down within a few hundred meters of a designated point.

Pete Conrad (Commander) and Alan Bean (LM Pilot) piloted the Apollo 12 lunar module Intrepid to a landing within 200 meters (650 feet) of Surveyor 3 on November 14, 1969. This proved the pinpoint landing capability. It also allowed the astronauts to collect parts from the Surveyor for engineering assessment and provided the opportunity to sample ejecta from the Copernicus crater impact and what appeared from crater counts to be relatively young mare basalt.

During their brief stay of 31-and-a-half hours, the two astronauts performed two extra-vehicular activities (EVA), each a little under four hours in length.

On the first EVA, they deployed an Apollo Lunar Surface Experiment Package (ALSEP), which returned scientific data directly to the Earth for over seven years. Next the explorers headed to the northwest to collect soil and rock samples. In all they collected about 15 kilograms (33 pounds) of lunar samples on this first EVA.

The next day, Conrad and Bean headed out on the first lunar geologic traverse. They traveled west, skirting around Head crater, then south to Bench crater. At both locations the astronauts collected rock and soil samples and photographed the interiors of the two craters. After Bench, their furthest point from the LM was Sharp crater. Their next goal was a rendezvous with the Surveyor 3 spacecraft, some 450 meters (less than half a mile) to the east.

The Surveyor landed on the interior slope of what was later called Surveyor crater. There was some worry that as the astronauts removed parts from it, the spacecraft might slide downhill so they always stayed upslope.

In all, the Apollo 12 crew returned over 32 kilograms (70.5 pounds) of lunar samples. From these precious samples scientists learned that the Copernicus crater impact occurred some 810 million years ago; four different types of local basalts were sampled with ages much younger than those from Apollo 11, and a small sample of highlands rock previewed the complexity of the lunar highlands to be sampled on later Apollo missions. All in all, Apollo 12 was an incredible success and it paved the way for science missions to come.

In July, LRO was — and still is — in the commissioning phase. The highest priority of the LROC team at that point and the present time was testing and calibrating all the instruments to ensure that LROC could meet its mission requirements during the coming nominal mapping mission. Due to operational constraints, it was not possible to collect the Apollo 12 site, the westernmost landing site, at that time.

"There are only so many locations that can be imaged at one time," Robinson says. "Not every target can be imaged every time around. I'm glad we had to wait another month, it was very exciting to see this image a month after the excitement of the first round of Apollo landing sites."

LRO is slated to orbit the moon for at least another 12 months, which means Robinson and his team have many more imaging opportunities ahead of them. In mid-September the spacecraft's orbit will be lowered, allowing LROC to acquire even higher resolution images of the Apollo and Surveyor landing sites.

For additional information about the LROC instrument and to view more lunar images from LROC, visit: http://lroc.sese.asu.edu.

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