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THE LUNAR ROVING VEHICLE – A LEGACY OF LUNAR SURFACE EXPLORATION

Abstract

The year 2012 marks the 40th anniversary of a significant event in the history of manned spaceflight: Apollo 17, which was the last of the Apollo missions and the most recent mission to carry man beyond the orbit of earth. The use of the Lunar Roving Vehicle, or LRV, was one of the primary characteristics of the mission, as it had been on the two previous Apollo missions. The main purpose of the LRV was to transport the astronauts, which saved time, oxygen, and the astronauts' energy. The LRV also had benefits as far as the geological prospects of the mission, as the astronauts of Apollo 17 were able to return more than one-hundred kilograms of rock to the Lunar Module using the LRV. The need for a lunar surface vehicle for the Apollo missions was recognized as early as 1952, when Wernher von Braun, the mastermind of the Saturn rockets, addressed the issue in Collier's Weekly magazine. At this point, the concept was to have three 10-ton tractor trailers hauling equipment and rock samples around the lunar surface. Twelve years later, von Braun gave an interview in the February 1964 issue of Popular Science, stating, more realistically, that a "moon jeep" with an open platform would be used for short-distance travel. By this time investigations of lunar mobility were already taking place at Marshall Space Flight Center (MSFC) in Huntsville, Alabama. It was initially thought that a lunar mission would utilize two boosters, one for the astronauts and one for equipment. This caused many years of lunar vehicle development to become invalid, since budget cuts ultimately made it impossible to have dual boosters for a single mission and thus cut the mass budget in half also. The contract for the final LRV was given to Boeing in 1969. Boeing would produce the chassis and electronics, as well as perform the assembly and testing. General Motors was given a subcontract to produce the wheels, suspension, and motors. Three LRVs were manufactured, one each for Apollo 15, 16, and 17. To this day, the Lunar Roving Vehicle remains the only manned surface vehicle to have ever operated on the lunar surface. The anniversary of Apollo 17 calls for an historical overview of the Lunar Roving Vehicle, and an exploration of its technical characteristics.