

SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 3 (2C)

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LUNAR WAY-STATION

Abstract

A Lunar Way-station is a test bed for operational aspects of a planetary outpost, defined here as a base on the surface of a planetary body. This paper aims to further develop the already initiated study of relevant architecture necessary for future strategic navigation systems, common geodetic net, timeframe and landing sites on the Moon with a view to promote international cooperation for lunar exploration. This study is being carried out within the framework of current projects of the Space Generation Advisory Council.

In accordance with the initial study conducted by the Planetary Society and the continuing study being carried out within the Space Generation Advisory Council, the author has further developed the idea of an International Lunar Way-station as a first step towards a planetary outpost/test-bed. A two layered system has been considered for tracking and navigation purposes i.e. primary layer for basic communication and secondary layer as a back-up system. Several international landing sites have been further studied and discussed according to different mission priorities and presented alongside their benefits and limitations. The paper addresses criteria that would be applicable to the different scenarios. In addition the author has tried to further develop some possible landing technologies.

In-situ Resource Utilization (ISRU) and self-sustainable environmental management systems have been identified as essential, for the Lunar Way-station to function as a true ‘test bed’ for future planetary outposts, thus further design aspects of such a ‘test bed’ are included in the paper.

With international cooperation within current lunar missions and projects, the help of emerging technologies, involvement of the private sector, universities and agencies, the possibility of a Lunar Way-station could become a reality. If so, it could prove to be a blessing for future planetary exploration and Human spaceflight. The Moon provides a potential place for study and analysis of sample return missions from anywhere in the solar system and could some day also serve as a base used to co-ordinate Human Interplanetary missions.