

SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 1 (2A)

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OPEN SOURCE MISSION TO THE MOON

Abstract

The German non-profit amateur satellite organisation AMSAT-Deutschland successfully designed, built and launched four HEO satellites in the last three decades. Now they are going to build a satellite to leave the Earth orbit based on their flight-proven P3-D satellite design. Due to energetic constraints the most suitable launch date for the planned P5-A satellite to Mars will be in 2018. To efficiently use the relatively long time gap until launch a possible prior Moon mission came into mind. In co-operation with the DLR-Institute of Space Systems in Bremen, Germany, two studies on systems level for a first P5 satellite towards Moon and a following one towards Mars have been performed. By using the DLR's Concurrent Engineering Facility (CEF) two consistent satellite concepts were designed including mission analysis, configuration, propulsion, subsystem dimensioning, payload selection, budgeting and cost.

The present paper gives an insight in the accomplished design process and the results of the performed study towards Moon. The developed Moon orbiter is designed to carry the following four main instruments besides flexible communication abilities:

- slewable HDTV camera combined with a high gain antenna that allows receiving lunar television using a commercially available satellite TV dish on Earth
- sensor imaging infrared spectrometer for mineralogy of lunar silicates and lunar surface temperature measurements
- camera for detection and monitoring of impact flashes in visible light (VIS) on lunar night side caused by meteoroid impact events
- camera technology test for interplanetary navigation and planetary approach navigation.

This study presents a non-industrial satellite concept that could be launched as piggyback load on Ariane 5 into GTO. It promises a low cost mission towards Moon with spectacular values from a public as

well as scientific point of view. Due to the fact, that the satellite would be built by a private organisation, the mission is designed to be open to everyone who wants to join the project – collaborative, financially, or just receiving or using the produced data.