

24th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM (A5)
Human Exploration of Mars (2)

Author: Prof. Jean-Marc Salotti
Laboratoire de l'Intégration du Matériau au Système, France, jean-marc.salotti@ensc.fr

Mr. Michel Lamontagne
Canada, michel.residence@gmail.com

SINGLE STAGE TO ORBIT VEHICLE BETWEEN PHOBOS AND MARS SURFACE.

Abstract

Numerous architectures have been proposed for a human mission to Mars. Most of them are appropriate for the first missions but in the long term, important improvements are expected to reduce the complexity and costs of the missions. Assuming the presence of water and carbonates on Phobos [1], it might be possible to use this Moon of Mars as a refueling station for rockets coming from Earth and Mars. In the long term, an interesting perspective is to manufacture on Mars a single stage to orbit space plane, called Albatros, that could be used to transfer crews and cargo from Mars orbit to Mars surface and the other way round. Technical specifications and illustrations of this SSTO are given as well as a range of possible applications. This idea was developed in a proposal in response to the recent Mars Society City State Design Competition, where we achieved the third place [2]. References: [1] Fanale, Fraser P., Salvail, James R. (December 1990), "Evolution of the water regime of Phobos". *Icarus*. 88 (2): 380–395. [2] Michel LAMONTAGNE, Laurent GAUTHIER, Jean-Marc SALOTTI, Florent BEDNAREK, Carl VAMBERT, Olivier GOURDON, Rémy NAVARRO, "Foundation", in Mars City State Design Competition, Frank Crossman ed., in press, 2021.