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DESIGN OF MARS VTOL AIRCRAFT - A NEW HOPE FOR MARTIAN SEARCH.

Abstract

Mars exploration has been a topic of interest since decades and it will still be for centuries to come. We started from Mars orbiter to Perseverance Rover up to Ingenuity helicopter. But to get more crucial understanding of the planet we need faster medium to discover the elements of the same. This paper proposes a novel concept of Vertical Take Off and Landing (VTOL) aircraft in Mars exploration and will provide the preliminary design; development methods and other important features like sensors including but not limited to Alpha Particle X-Ray Spectrometer (APXS), Hazard Avoidance Camera (HAZCAM), Navigation Camera (NAVCAM); communication systems to and from Rovers, orbiters, earth stations; propulsion systems; aerodynamic analysis, etc. The type of mission profile offered in a VTOL aircraft will help to explore the unexplored regions of the planet due to the undulating terrain. During ascent and decent phase, the aircraft will act just as a helicopter which will ease the access to the critical spots on the Martian surface and the aircraft will resemble the linear motion of an airplane during the translation phase. The use of solar cells mounted on the wings to maximize the search area will be of pivotal importance during the missions. The VTOL proposed in this paper is supposed to be a practical solution to the exploration challenges offered by the Martian terrain.