

TOP TEN

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Design of Extreme Altitude Mountain Rescue Vehicle 'Chocard'

Transporting people by helicopter at very high altitudes is not generally feasible. This presents both technical difficulties as well as commercial opportunities, in emergency services and adventure tourism. Freezing temperatures, low atmospheric pressure and harsh climate with mostly reduced visibility all add up towards making transporting persons, whether rescuing them or conveying them, very risky. Since the weather conditions can change very quickly, receiving relevant information for mission preparation and possible mission adjustments can be as important as vehicle performance. Nowadays, some helicopter models are modified to carry out high altitude mountain rescue operations. However, no model is currently in the market that has been created specifically for this particular purpose. This project describes the design of an Extreme Altitude Mountain Rescue Vehicle named 'Chocard'. The mission of the reconfigurable Vertical Take-off and Landing aircraft is to transport human persons over a specified mission profile, subject to various constraints. The project includes the initial sizing, choice of propulsion system, the preliminary design of the lifting surfaces, fuselage, landing gear, the expected performances and limitations. The aircraft configuration was generated through the use of various design philosophies such as optimization through iteration, component build-up drag estimation, and realistic systems integration using empirical data from several sources. The aircraft utilises existing aeronautical technologies to fulfil its mission objective.

