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MARTIAN MISSION CONTROL: A NOVEL CONCEPT FOR MANNED INTERPLANETARY  
MISSIONS.

**Abstract**

The renewed interest in space missions that has sparked the on-going Space Race, both on the public and commercial sides, has produced an increasing number of concepts for interplanetary missions, with a growing scope of achievement; in this context of development, new challenges are posed, and new technologies are being developed, but one concept still stands from the very start of the Space Race more than sixty years ago: the need for a control center that can direct and assist operations, especially for manned missions that rely on near to real-time consultancy both during nominal operations and during contingencies. Historical cases like the Apollo 13 mission in 1970 clearly show how much of a difference can make an infrastructure capable of more than just feedback: such capability was made possible largely due to a continuous communications link of Earth-based resources, vital especially during the first moments of crisis. Today's concepts of mission to Mars, many of which aim to achieve more than just one-off missions but rather permanent bases on the Red Planet, will face a different situation when it comes to real-time mission control: as the vehicle headed to Mars will be more and more distant, so the time of response will proportionally increase. The time lag for communications varies with the distance between Mars and the Earth, averaging between 5 and 20 minutes, making real-time assistance impossible. As missions are expected to grow in complexity, the need for real-time assistance is also complicated by the larger number of vehicles that will populate the future "Martian flight zones": this paper deals with the design of a notional Mission Control Room located on the Red Planet's surface to monitor, direct and assist Martian operations both of crewed and uncrewed vehicles. Starting from Earth-based architecture of real Control Centers, we'll translate those paradigms to the new setting of a repurposed Martian Base Module, developing a concept that incorporates a new philosophy in terms of Mission Control capabilities and Data Analysis. Given the convenience of having such a flexible, adaptable concept done with advanced multimedia technologies, this room can grow to become more than just a control center, but a multi-purpose, all-round facility for Mars Missions to succeed and thrive.