

2001 MARS ODYSSEY PROJECT REPORT

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The Odyssey Orbiter was launched on April 7, 2001, using a Delta II launch vehicle, from Cape Canaveral, Florida. During the subsequent six months, Odyssey cruised to Mars arriving on October 23 where it flawlessly performed the Mars Orbit Insertion (MOI) propulsive burn. The initial post-MOI orbital period was about 18.5 hours. The orbital period was then gradually reduced to 2 hours over approximately the next 80 days using aerobraking to enable the February 02 start of the science mapping mission.

This paper provides a broad-scoped description of the 2001 Mars Odyssey Project covering the salient features of: the mission and science objectives, the orbiter design/development, the flight operational performance from launch through MOI, the three-month long intensive aerobraking activity and the results from early science mapping operations. In particular, this paper describes major risk reduction actions taken by the Odyssey Project to improve the prospects for mission success. In addition, this paper details the flight operational aspects of aerobraking discussing how the Project dealt with the uncertain atmospheric characteristics, specifically the navigation and sequencing strategies used to ensure Odyssey health/safety and readiness to carry out the science mapping mission.