Title: Overview of the Mars Reconnaissance Orbiter Mission
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In August 2005, NASA will launch the Mars Reconnaissance Orbiter (MRO) aboard an Atlas IIIB launch vehicle from Cape Canaveral Air Force Station in Florida. This mission has the primary objective of delivering into a low altitude orbit at Mars a spacecraft capable of performing remote sensing science investigations. A major mission of the Mars Exploration Program (MEP), MRO will pursue the Program's "Follow-the-Water" theme by conducting observations that will return sets of globally distributed data that will be used to: 1) advance our understanding of the current Mars climate, the processes that have formed and modified the surface of the planet, and the extent to which water has played a role in surface processes; 2) identify sites of possible aqueous activity indicating environments that may have been or are conducive to biological activity; and 3) identify and characterize sites for future landed missions.

In addition to its scientific objectives, MRO will provide telecommunications relay capability for follow-on missions and will conduct, telecom and navigation demonstrations in support of future MEP activities. Specifically, the MRO mission will: 1) provide navigation and data relay support services to future MEP missions, 2) demonstrate Optical Navigation techniques for high precision delivery of future landed missions, and 3) perform an operational demonstration of high data rate Ka-band telecommunications and navigation services

Designed to operate after launch until at least the year 2011, MRO will use a new spacecraft bus design. The orbiter payload will consist of six science instruments and three engineering payload elements listed as follows:

- Science Instruments
    - HiRISE, High Resolution Imaging Science Experiment
    - CRISM, Compact Reconnaissance Imaging Spectrometer for Mars
    - MCS, Mars Climate Sounder
    - MARCI, Mars Color Imager
    - CTX, Context Imager
    - SHARAD, Shallow (Subsurface) Radar

- Engineering Payloads
    - Electra UHF communications and navigation package
    - Optical Navigation (Camera) Experiment
    - Ka Band Telecommunication Experiment

Following launch, MRO will be guided to Mars on an interplanetary trajectory that will take about seven months. After capture into a highly elliptical orbit, MRO will use aerobraking techniques to establish its primary science orbit (PSO). The PSO will have a periapsis altitude of 255 km and an apoapsis altitude of 320 km. The orbit orientation will be near-polar with an ascending node designed for a mid-afternoon equatorial crossing time that will be maintained in a sun-synchronous condition. The repeating groundtrack of the PSO has been designed based on the need for targeted, regional survey, and mapping observations.

The primary science phase of the mission is scheduled to begin in November 2006 and will extend for one Mars year following turn-on of the science instruments in the PSO. After the completion of the primary science phase, MRO will conduct relay operations until its nominal end of mission. This paper will discuss the mission and science objectives, the mission design, the spacecraft and its payload suite, and initial operations planning activities.