MRO PHASES:

REF := Mars Reconnaissance Orbiter Jim Taylor, Dennis K. Lee, and Shervin Shambayati

<https://descanso.jpl.nasa.gov/monograph/series13/DeepCommo_Chapter6--141029.pdf>

REF := National Aeronautics and Space Administration Mars Reconnaissance Orbiter Arrival

<https://www.jpl.nasa.gov/news/press_kits/mro-arrival.pdf>

REF := An overview of the Mars Reconnaissance Orbiter (MRO) science mission Richard W. Zurek1 and Suzanne E. Smrekar1

<https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2006JE002701>

REF : = The Mars Reconnaissance Orbiter Mission Operations: Architecture and Approach

<https://arc.aiaa.org/doi/pdf/10.2514/6.2006-5956>

IP = IPOTIZED under obvious reasoning.

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| LEOP (3 days)  REF  REF | * Spacecraft separated from the launch vehicle 58 minutes after launch. REF * 4 minutes before the separation X-band (TWTA) begun warming up. REF * 1 minute after separation the LGA1 began transmitting a downlink. REF * Radio contact with earth 61 minutes after launch. REF * MRO expired a single inertia attitude for the whole launch period. REF * Solar panels completely unfold after 14 after separation. REF * HGA completely unfold after 21 minutes. REF * USO was turned on within few hours. REF |
| CRUISE and APPROACH (150 days)  REF  REF  REF  REF | * characterize and validate the performance of the UHF antenna REF * 27 august 2005 TCM-1 took place + 30-second burn of six smaller (22 N) thrusters, which settled propellant in the craft’s fuel tank for smoother flow. REF * Payload and instruments calibration and checkup started on 30 August 2005. REF REF REF * Navigation and attitude activities to improve accuracy. REF REF REF * November 18, 2005, TCM-2 took place by using only the smaller TCM thrusters in a 20-second burn. REF * During the last two moths the Optical Navigation Camera (ONC) was used to observe the Martian moons, Phobos and Deimos to accurately determine the location of the orbiter REF/ REF REF |
| MOI  REF  REF | * 21:36:00 GMT on March 10, 2006 the MRO entered in the first Martian orbit by thrusting with main engines for 27 minutes. REF * Pitch and yaw control was maintained by off-pulsing the six trajectory correction manoeuvre (TCM) engines while roll control was provided using the eight ACS (attitude control system) engines. REF * Payloads tests and first activities on atmosphere. REF |
| Aerobraking  (March 30, 2006 and ended August 30, 2006)  REF  REF REF REF | * Initial (22 N) thrusters activated for 58 seconds. REF * Temperature, atmosphere sensing, Keplerian element calculation to evaluate right small manoeuvres to perform efficient aerobraking. REF REF REF * (solar conjunction operations ???) REF * Periapsis Raise and circularization manoeuvres took place the September 11, 2006. REF |
| Preparation for Primary science phase(PSP)  REF | * Deployment of the 10-meter SHARAD radar antenna and of the CRISM telescope cover (16 September). REF * Full calibration of SHARAD. REF * Final checkouts and testing to prepare next phase. REF * Nominal attitude achieved. REF |
| PSP (7 November 2006 - 18 November 2008)  REF  REF | * Science Acquisition Activities. (very specific CON-OPS ). REF REF * Attitude and navigation calibrations and manouvers. REF REF * Data handling, downlink and uplink (with antenna reorientations obv). REF REF |
| Raley Phase  6 months before the end of the PSP - end of the MRO 3 As of 2014.  REF  REF | * Phoenix missions support. (very specific CON-OPS ). REF REF * MSL mission Support. \*\* REF REF * MER mission Support. \*\* REF REF * Attitude and navigation calibrations and manouvers. IP * Data handling, downlink and uplink (with antenna reorientations obv). IP |
| Extended Mission (2010 – now)  REF | * science and relay operations. (very specific CON-OPS ). REF * Attitude and navigation calibrations and manouvers. IP * Data handling, downlink and uplink (with antenna reorientations obv). IP |
| End and Disposal | NO DATAS FOUND |