

# Mars Network Architecture

Gary K. Noreen  
Jet Propulsion Laboratory  
4800 Oak Grove Drive, M/S 301-170S  
Pasadena, California 91109-8099  
Telephone: (818) 354-6048  
E-mail: [gary.k.noreen@jpl.nasa.gov](mailto:gary.k.noreen@jpl.nasa.gov)

NASA has constructed a network of orbiters at Mars that can provide navigation services and relay communications to and from robotic probes in the vicinity of Mars. This Mars Network, which currently consists of NASA's Mars Global Surveyor and Mars Odyssey orbiters, will soon be augmented by the European Space Agency's Mars Express orbiter. The Mars Network will be used later this year by two NASA Mars Exploration Rovers and by the British Beagle II lander.

To support future missions, NASA will add its Mars Reconnaissance Orbiter to the Mars Network in 2005 and the Mars Telecommunications Orbiter (MTO) in 2009. MTO will be the first interplanetary spacecraft whose primary mission is to provide communications services to other missions.

The Mars Network has been assembled in an ad hoc manner by adding relay radios to orbiters sent to Mars primarily for remote-observations. This approach has resulted in several architectural and compatibility challenges – institutional as well as technical. An international protocol was standardized early on to facilitate compatibility.

This presentation will review the evolution of the Mars Network. It will describe the architecture of the network and show how MTO will revolutionize network capabilities. It will conclude with a discussion of Mars Network capabilities.