

Precision cartographic mapping of the Pathfinder landing site

Thomas C. Duxbury (tduxbury@mail1.jpl.nasa.gov), to be presented by C.H. Acton

Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109-8099, U.S.A.

Viking Orbiter images were reprocessed using new techniques to produce a precision controlled, photomosaic map of the Mars Pathfinder landing site prior to landing. The difference between the Mars-fixed coordinates of the lander as determined from the precision cartographic map product and that determined from earth-based radio tracking of the lander (Folkner, 1997) are essentially zero, within the accuracy of the radio tracking solution. The precision cartographic map product was produced from measuring a totally new control network of 586 points, local to the landing site, observed in 50 Viking Orbiter images. Mars-fixed areocentric coordinates of latitude, longitude and radius for each control point together with special camera pointing parameters and orbit parameters were estimated in the block adjustment, typically not estimated in previous cartographic efforts. Convergence angles of typically 40 deg and as large as 90 deg for the control points were achieved in the highly over determined system of observations. No tie was made to the nearby Viking 1 landing site and special data weighting was employed to produce the map which was tied to the digital terrain model derived from the dense control network.