

Pathfinder Rover Cameras: Resolution, Stereometry, and Geology

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Mobility of the rover is an important attribute for the exploration of Ares Vallis, Mars. This attribute permits the rover to carry its spatial resolution and stereoscopic base to large distances from the lander. For example, the spatial resolution 40 cm ahead of the rover camera is the same, nearly 1.3 mm per pixel, at any distance from the lander. Likewise, the separation between the two rover cameras is always 12.6 cm so that convergence angles 40 cm ahead of the rover are the same at any distance from the lander. Additionally, the rover can view landforms from all directions. This is not the case for the IMP camera on the fixed base of the lander for which spatial resolutions and convergence angles decrease with distance and only lander-facing surfaces of landforms are visible. For objects further than 1.3 m from the lander camera, yet within 40 cm of the rover cameras, the spatial resolution of the rover cameras is always better than that of the lander camera.

We illustrate the attribute of mobility by comparing rover and lander camera images at a variety of distances from the lander, preparing profiles and maps with the rover stereoscopic pairs, and interpreting the images.

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