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MARS HIGH-RESOLUTION MAPPING

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A series of photomosaics of high-resolution Viking Orbiter images of Mars is being prepared and published to support the Mars 1:500,000-scale geologic mapping program. More than 100 of these photomosaics were made manually, but for the last several years they have all been made digitally. The digital mosaics are published on the MTM (Mars Transverse Mercator) system, and they are also available to the appropriate principal investigators as digital files in the MDIM (mosaicked digital image model) format. We hope that they can eventually be published on CD-ROM disks. The mosaics contain Viking Orbiter images with the highest available resolution; in some areas as high as 10 m/pixel. This resolution where it exists, will support a 1:100,000 map scale. The full resolution of a mosaic is preserved in a digital file, but conventional lithographic publication of such large-scale inset maps will be done only if required by the geologic map author. When high-resolution images do not fill the neatlines of an MTM quadrangle, the medium-resolution (1/256°/pixel, or 231 m/pixel) MDIM is used.

The mosaics are tied by image-matching to the planetwide MDIM, in which random errors as large as 5 km (10 mm at 1:500,000 scale) are common; a few much larger, "worst-case" errors also occur. Because of the distribution of the errors, many large discrepancies appear along the cutlines between frames with very different resolutions. Furthermore, each block of quadrangles is compiled on its own local control system, and adjacent blocks, compiled later, are unlikely to match.

Selection of areas to be mapped is based on geologic mapping proposals reviewed and recommended by the Mars 1:500,000-scale geologic mapping review panel. There is no intention to map the entire planet at this scale.