

NOTES ON BASE

This map is part of a new series of topographic maps of areas of special scientific interest on Mars, compiled photogrammetrically from Viking Orbiter stereo image pairs.

M 500K -5/82 OMT. Abbreviation for Mars 1:500,000 series; center of sheet lat 5° S., long 72° W.; ortho-photomosaic (OM) with topographic contours and nomenclature (T)

ADOPTED FIGURE

The figure of Mars used for the computation of the map projection is an oblate spheroid (flattening of 1/192) with an equatorial radius of 3393.4 km and a polar radius of 3375.7 km. Because Mars has no surface water, and hence no sea level, the datum (the 0 km contour line) for elevations is defined by a gravity field described by spherical harmonics of fourth degree and order (Jordan and Lorell, 1973), combined with a 6.1 millibar atmospheric pressure surface derived from radio occultation data (Kliore and others, 1973; Christensen, 1975).

PROJECTION

The projection is part of a Mars Transverse Mercator (MTM) system with 20° zones. The scale factor at the central meridian of the zone containing this quadrangle is 0.9960 relative to a nominal scale of 1:500,000.

CONTROL

Horizontal and vertical control was established by analytical photogrammetric aerotriangulation, using the General Integrated Analytical Triangulation (GIANT) program of the U.S. Geological Survey. A local control network was derived and tied to a global control net that has a published horizontal standard error of 5 km (Wu and Schaler, 1984). The control net developed at RAND (Davies and others, 1978; Davies and Katayama, 1983) was used as a secondary source of control information. Note that the distribution of Viking Orbiter images suitable for mapping at a scale of 1:500,000 is uneven, as are the quality and distribution of control points. Areas mapped in this series are chosen, often in blocks of two or more adjacent quadrangles, on a basis of scientific interest as well as on the availability of suitable data for accurate mapping. In addition, refinement of the control nets is ongoing. Where discrepancies exist between adjacent maps, the more recent compilation is likely to be more accurate.

CONTOURS

Contours were compiled on an analytical stereoplotter, using Viking Orbiter stereo image pairs with orientation parameters derived from the analytic aerotriangulation. Local projected vertical precision, based on image resolutions, parallels-to-height ratio (that is, convergence angle), and a matching accuracy of 0.2 pixel ranges from 179 m to 435 m, with a mean of roughly 332 m. Elevation values (expressed in meters) are given with respect to the adopted Mars topographic datum. Dashed contours are approximate.

IMAGE BASE

The image base for this map was taken from a digital image mosaic with a scale of 60 m per pixel, compiled by the methods described by Batson (1987) and Edwards (1987). After reprojection of the image data to the correct map projection, orthorectification of the mosaic was performed by identifying a large number of corresponding feature points in the image and topographic datasets; the image to match the contours. Image contrast was purposely suppressed to enhance contour lines. Image processing by Alfred McEwen, Carrie Mitchell, and Bonnie Redding.

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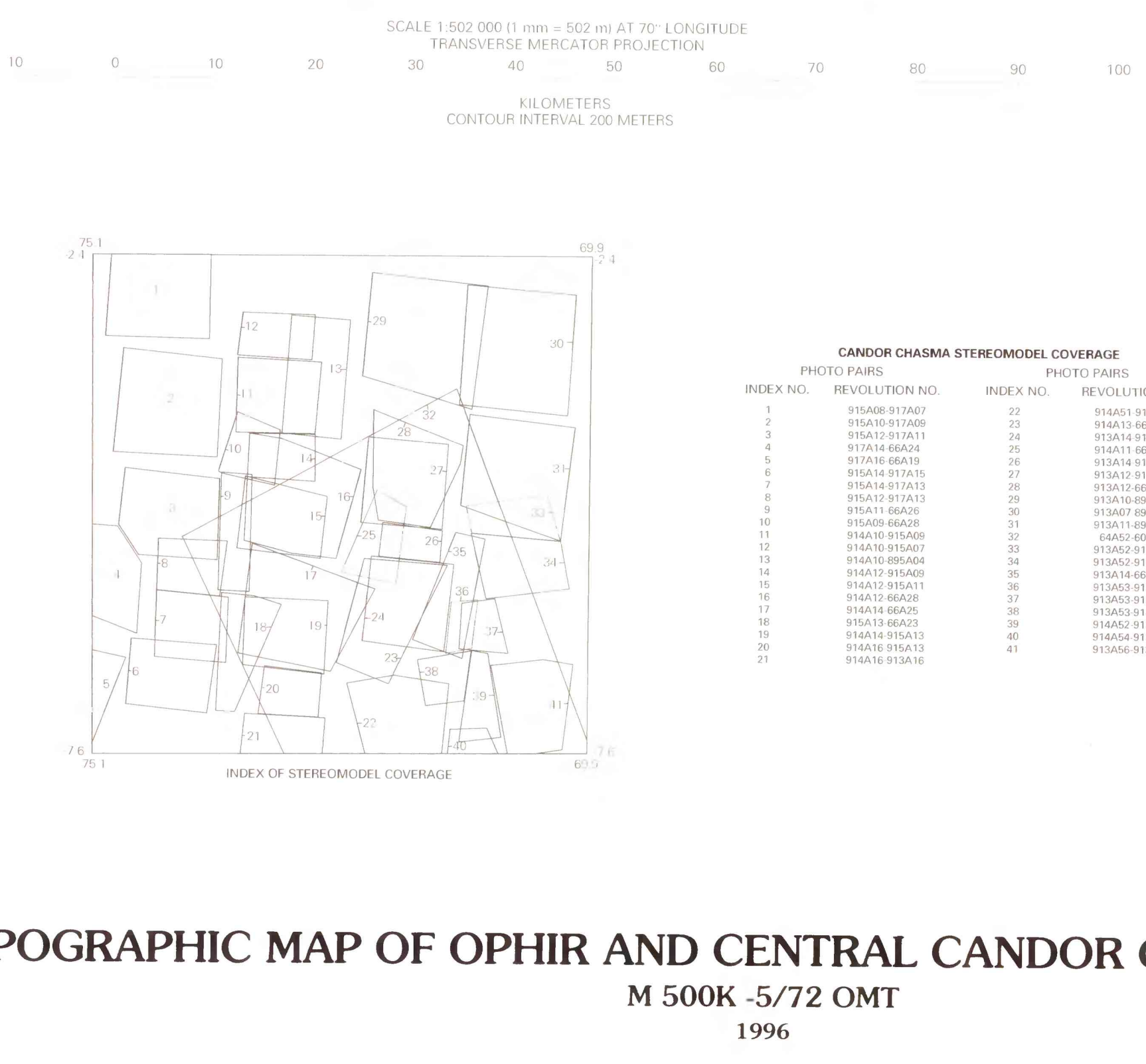
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TOPOGRAPHIC MAP OF OPHIR AND CENTRAL CANDOR CHASMATA OF MARS
M 500K -5/72 OMT
1996

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