TITHONIUM   CHASMA

TITHONIAE

CATENAE

TITHONIAE

FOSSAE

IUS   CHASMA

Prepared on behalf of the Planetary Geology Program, Solar System Explora-
tion Division, Office of Space Science, National Aeronautics and Space
Administration

SCALE 1:502 000 (1 mm = 502 m) AT 90° LONGITUDE
TRANSVERSE MERCATOR PROJECTION

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10    0    10   20   30   40   50   60   70   80   90  100
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KILOMETERS

CONTOUR INTERVAL 200 METERS

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 82° 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 Schafer, 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.
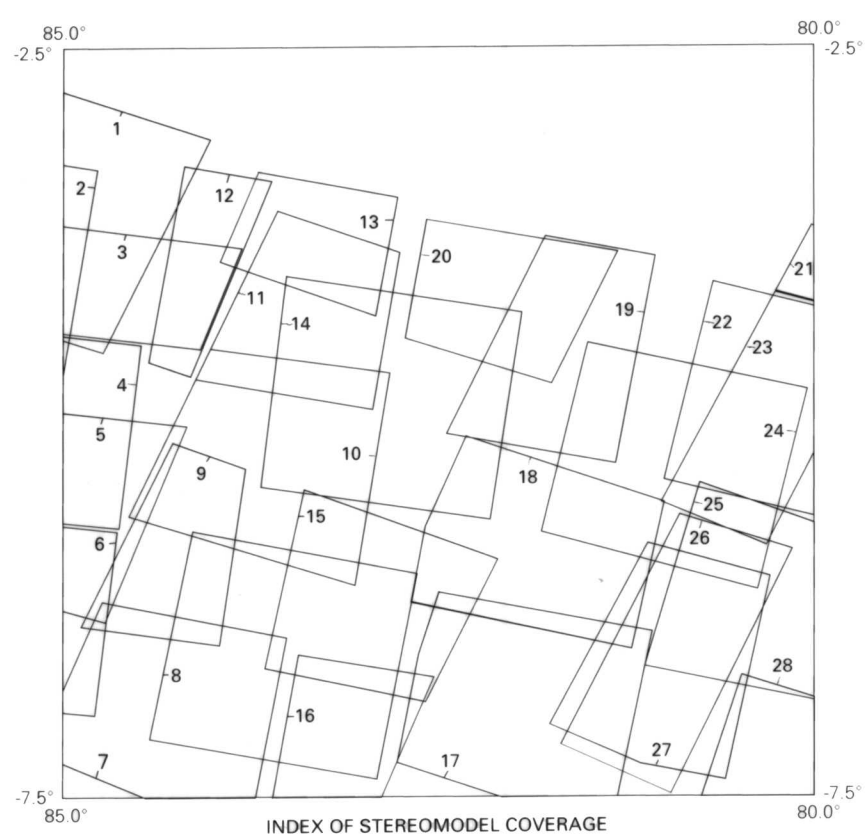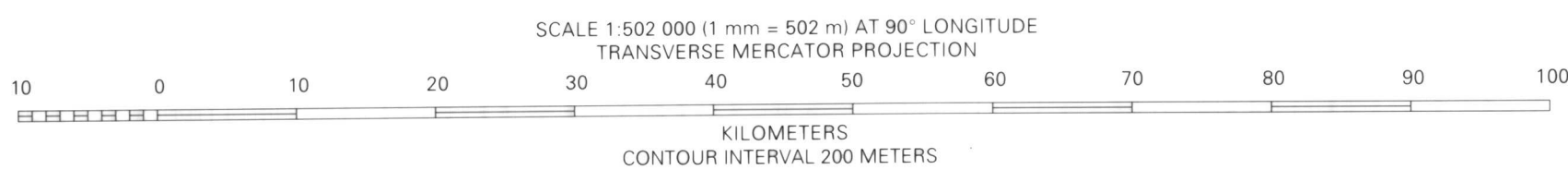
CONTOURS

Contours were compiled on an analytical stereoplotter, using Viking Orbiter stereo image pairs with orientation parameters derived from the analytic aerotriangulation. Local expected vertical precision, based on image resolutions, parallax-to-height ratio (that is, convergence angle), and a matching accuracy of 0.2 pixel ranges from 179 m to 700 m, with a mean of roughly 358 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 global Mosaicked Digital Image Model (MDIM) of Mars, which was compiled at a scale of 1/256° or approximately 231 m per pixel (Batson and Eliason, 1995). 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 and then warping the image to match the contours. Image processing by Carrie Mitchell and Bonnie Redding.

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INDEX OF STEREOMODEL COVERAGE

TITHONIUM CHASMA STEREOMODEL COVERAGE

INDEX NO.	PHOTO PAIRS REVOLUTION NO.	INDEX NO.	PHOTO PAIRS REVOLUTION NO.
1	57A47-58A56	15	65A18-58A22
2	57A47-58A46	16	65A15-58A23
3	66A22-57A47	17	65A15-58A23
4	66A22-57A45	18	65A18-58A23
5	57A45-66A21	19	64A27-58A25
6	57A43-66A18	20	64A27-58A26
7	66A12-66A22	21	66A22-58A25
8	66A14-58A22	22	66A22-58A25
9	66A21-58A22	23	65A22-65A44
10	66A23-58A24	24	66A20-58A25
11	66A26-58A24	25	65A19-63A42
12	66A26-57A47	26	59A23-63A40
13	58A26-58A24	27	65A17-63A42
14	66A25-58A24	28	66A12-63A42

QUADRANGLE LOCATION
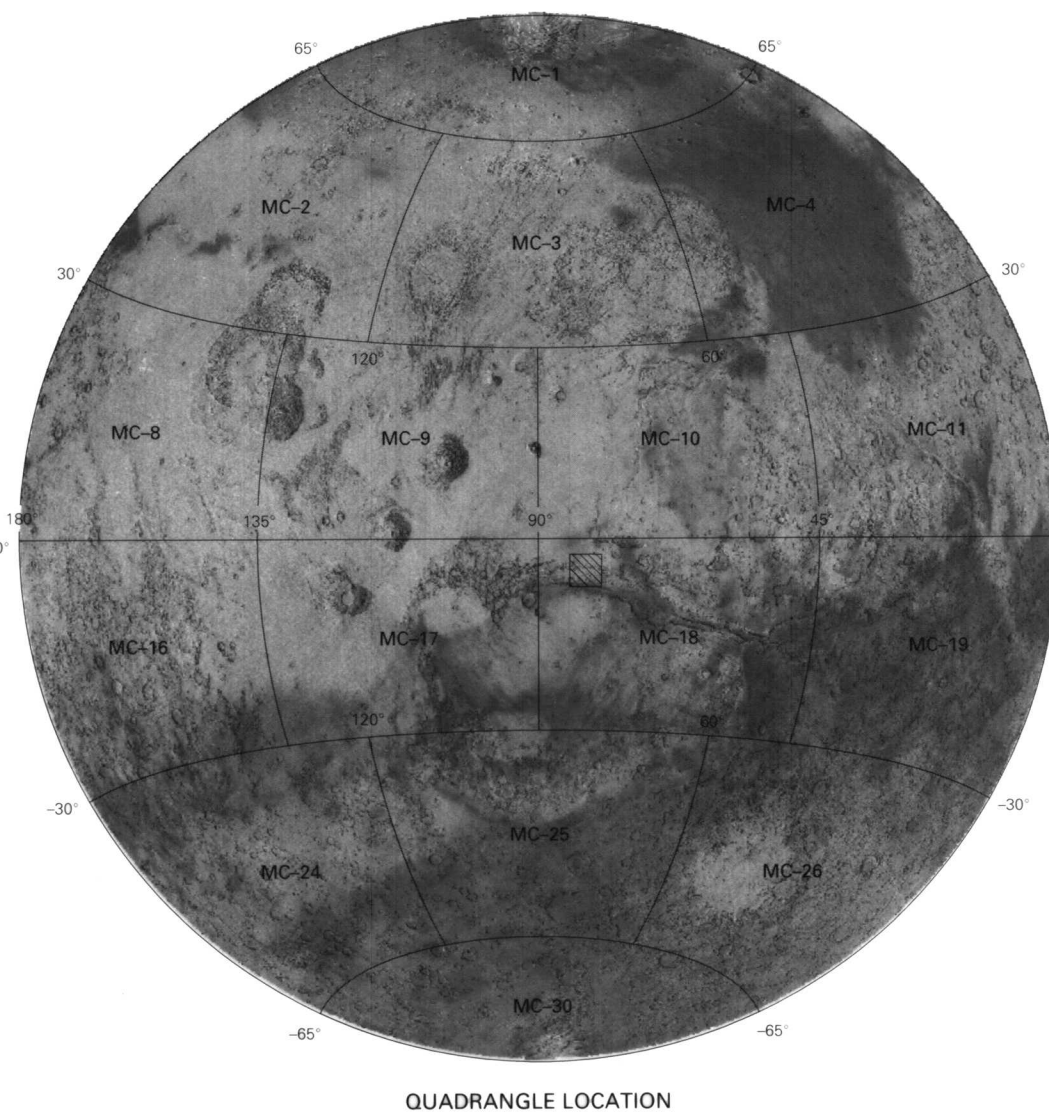
TOPOGRAPHIC MAP OF THE TITHONIUM CHASMA REGION OF MARS

M 500K -5/82 OMT

1996