

NOTES ON BASE
This map is one in a series covering the entire surface of Mars at a nominal scale of 1:5,000,000. The series was originally compiled from Mariner 9 data (Batson and others, 1979). The original shaded relief base was revised and augmented with image data from Viking Orbiter, but feature positions were not shifted to fit controls derived from Viking.

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 3,393.4 km and a polar radius of 3,375.7 km.

PROJECTION
The Mercator, Lambert Conformal Conic, and Polar Stereographic projections are used for this map series. The scale of the series is 1:5,000,000 at the equator. The projections have common scales of 1:4,336,000 at lat ±30° and 1:4,306,000 at lat ±65°. Standard parallels for the Lambert Conformal Conic projection are at lat ±35.8° and ±59.2°. Longitude increases to the west in accordance with astronomical convention for Mars. Latitude is planographic.

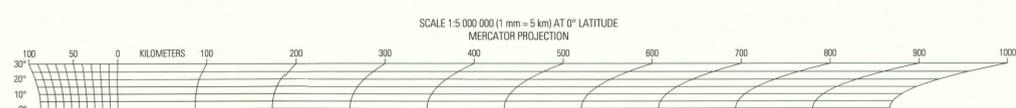
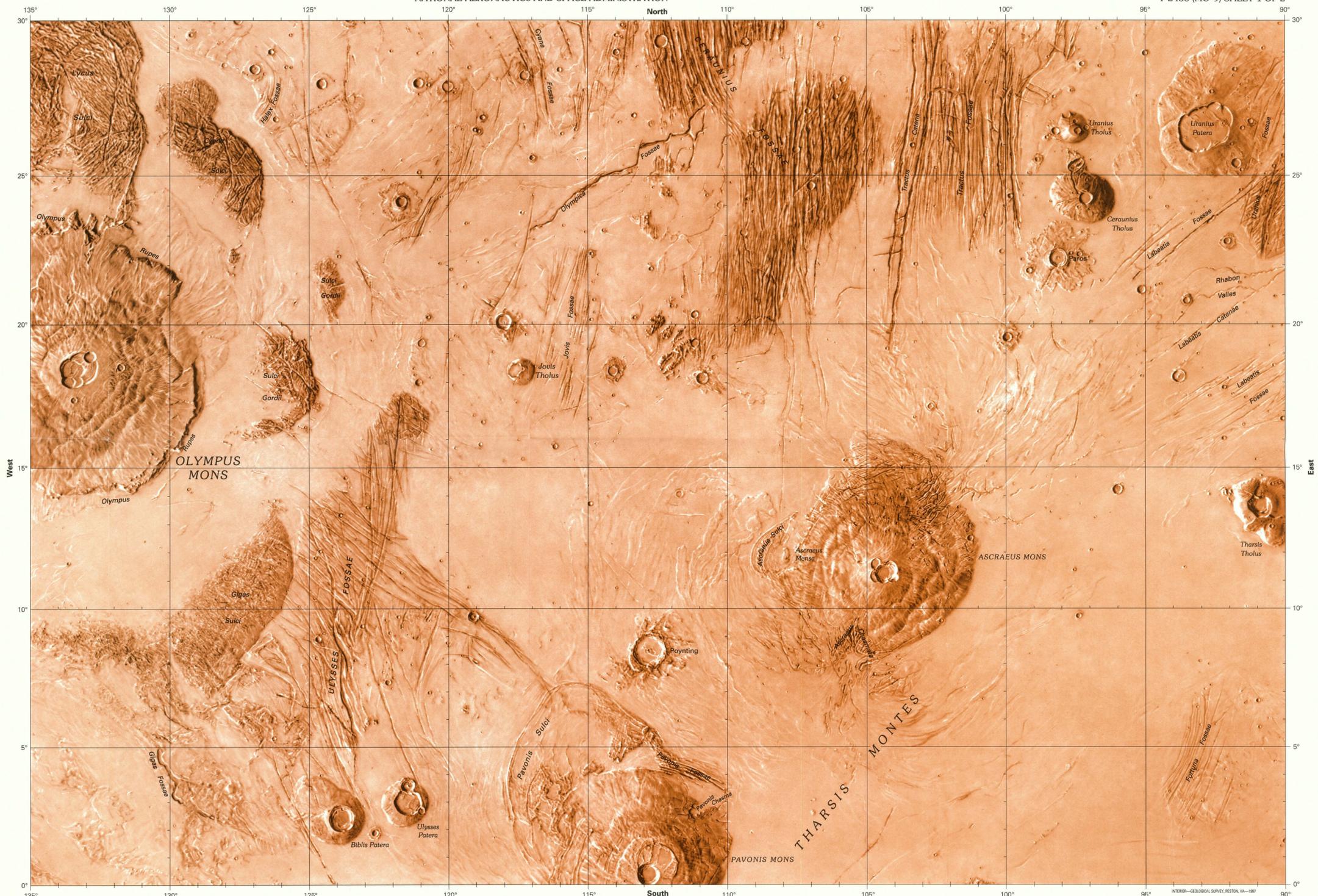
CONTROL
Planimetric control of the shaded relief is provided by photogrammetric triangulation using Mariner 9 images (Davies, 1973; Davies and Arthur, 1973) and the radio-tracked position of the Mariner 9 spacecraft. The first meridian passes through the center of a small crater, Airy-O (lat 5.19° S., long 0°), within the crater Airy.
Primary controls used in the network include the Viking Orbiter Secondary Experiment Data Record, radio-occultation measurements from both Mariner 9 and Viking Missions (Lovel and others, 1972; Klore and others, 1973; Lindal and others, 1979), Earth-based radar observations (Pettengill and others, 1971; Downs and others, 1975), and the Mars primary control network of the Rand Corporation (Davies and others, 1978).

MAPPING TECHNIQUE
Shaded relief was portrayed by photointerpretive methods described by Inge and Bridges (1976). Uniform sun illumination from the west was used throughout. The original rendition of feature positions, sizes, and shapes was taken from a controlled base mosaic of Mariner 9 images. Various computer enhancements of many Mariner 9 and Viking Orbiter images besides those in the base mosaic were examined in an attempt to portray the surface as accurately as possible.
Initial shaded relief analysis and representation, as well as revisions, were made by Patricia M. Bridges.

COLOR
No attempt was made on the map to duplicate precisely the color of the martian surface, although the color used may approximate it.

NOMENCLATURE
Names on this sheet are approved by the International Astronomical Union (1974, 1977, 1986, 1989, 1992).
MC-9: Abbreviation for Mars Chart 9.
M 5M 15/112 RN: Abbreviation for Mars; 1:5,000,000 series; center of sheet, lat 15° N., long 112°; shaded relief map (R) with nomenclature (N).

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Shaded relief revised in January 1987 on behalf of the Planetary Geology Program, Solar System Exploration Division, Office of Space Science, National Aeronautics and Space Administration.
This map supersedes map I-1922.
Edited by Doris Weir and Derrick D. Hirsch; cartography by Darlene A. Casseber.
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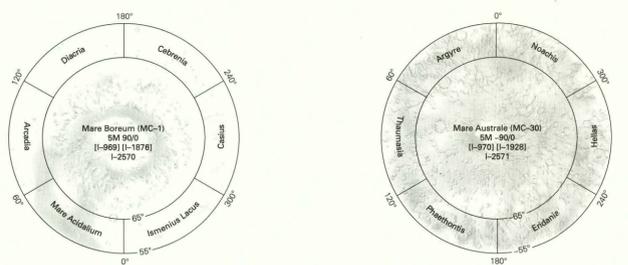
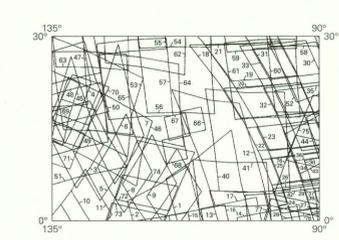


Chart No.	Center	Latitude	Longitude
MC-1	Mars Boreum	10° N.	0°
MC-2	Diacia	10° N.	120° W.
MC-3	Mars Australe	30° S.	180°
MC-4	Mars Australe	30° S.	150° W.
MC-5	Mars Australe	30° S.	120° W.
MC-6	Mars Australe	30° S.	90° W.
MC-7	Mars Australe	30° S.	60° W.
MC-8	Mars Australe	30° S.	30° W.
MC-9	Mars Australe	30° S.	0°
MC-10	Mars Australe	30° S.	30° E.
MC-11	Mars Australe	30° S.	60° E.
MC-12	Mars Australe	30° S.	90° E.
MC-13	Mars Australe	30° S.	120° E.
MC-14	Mars Australe	30° S.	150° E.
MC-15	Mars Australe	30° S.	180°
MC-16	Mars Australe	30° S.	150° W.
MC-17	Mars Australe	30° S.	120° W.
MC-18	Mars Australe	30° S.	90° W.
MC-19	Mars Australe	30° S.	60° W.
MC-20	Mars Australe	30° S.	30° W.
MC-21	Mars Australe	30° S.	0°
MC-22	Mars Australe	30° S.	30° E.
MC-23	Mars Australe	30° S.	60° E.
MC-24	Mars Australe	30° S.	90° E.
MC-25	Mars Australe	30° S.	120° E.
MC-26	Mars Australe	30° S.	150° E.
MC-27	Mars Australe	30° S.	180°
MC-28	Mars Australe	30° S.	150° W.
MC-29	Mars Australe	30° S.	120° W.
MC-30	Mars Australe	30° S.	90° W.

1:2,000,000-SCALE CONTROLLED PHOTOMOSAICS

Series	Quadrangle
I-1259	MC-9 NW
I-1258	MC-9 NE
I-1261	MC-9 SW
I-1260	MC-9 SE



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8	41A41	31	444A23
9	41A43	32	444A24
10	41A50	33	444A25
11	41A53	34	444A26
12	29A73	35	444A27
13	29A74	36	444A28
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4	8957181	26	7183368
5	8957182	27	7183438
6	8957183	28	7183508
7	8957184	29	7183578
8	8957185	30	7183648
9	8957186	31	7252158
10	7038168	32	7252228
11	7038238	33	7252298
12	7038308	34	7252368
13	7038378	35	7252438
14	7038448	36	7252508
15	7038518	37	8208854
16	7111128	38	8208924
17	7111198	39	8370554
18	7111268	40	8442584
19	7111338	41	8513614
20	7111408	42	8514644
21	7111478	43	8515674
22	7111548		

QUADRANGLE LOCATION
Number preceded by I refers to published shaded relief map. (Number in brackets refers to earlier map superseded by revised version.)

NOTES TO USERS
Users noting errors or omissions are urged to indicate them on the map and to forward it to U.S. Geological Survey, Building 4, Room 450, 2255 North Gemini Drive, Flagstaff, Arizona 86001. A replacement copy will be returned.

REVISED SHADED RELIEF MAP OF THE THARIS QUADRANGLE (MC-9) OF MARS