

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NOTES ON BASE
A series of topographic maps covering the entire surface of Mars at a nominal scale of 1:5,000,000 was originally compiled from Mariner 9 data. Details of the Mariner 9 mission related to the mapping were described by Batson and others (1979). The revised version is based on Viking Orbiter images. A series of papers describing the Viking mission was published in the Journal of Geophysical Research (American Geophysical Union, 1977).

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.

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 1:4,290,000 at lat ±45. 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.

CONTROL
Planimetric control is provided by photogrammetric triangulation using Mariner 9 pictures (Davies, 1973; Davies and Arthur, 1972) and the radio-tracked position of the Mariner 9 spacecraft. The first meridian passes through the center of a small crater, Ary-0 (lat 5.19° S., long 0°), located within the crater Ary.

MAPPING TECHNIQUE
A series of mosaics of Mariner 9 pictures was assembled at 1:5,000,000 scale based on projections described above.

Shaded relief was portrayed using airbrush techniques detailed by Inge (1972) and photointerpretive methods described by Inge and Bridges (1976). Uniform sun illumination from the west was used throughout. Sizes, shapes, and positions of features were taken from the base mosaic. In the first edition of the map, various computer enhancements of many Mariner 9 pictures, besides those in the base mosaic, were examined in an attempt to portray the surface as accurately as possible. This revised edition was produced by incorporating information derived from various enhancements of higher resolution Viking images of the map area.

Original shaded relief analysis and representation were made by Anthony G. Sanchez. Revisions were made by Barbara J. Hall.

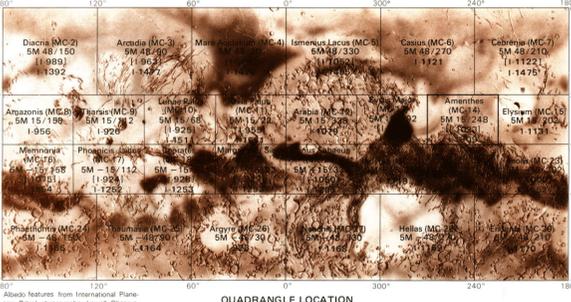
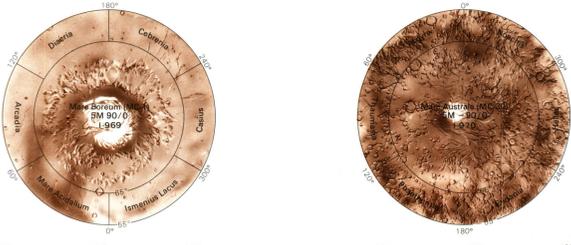
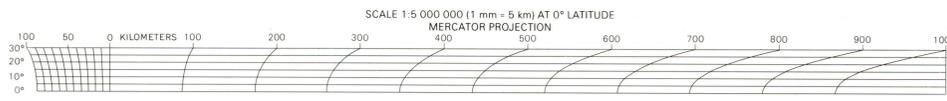
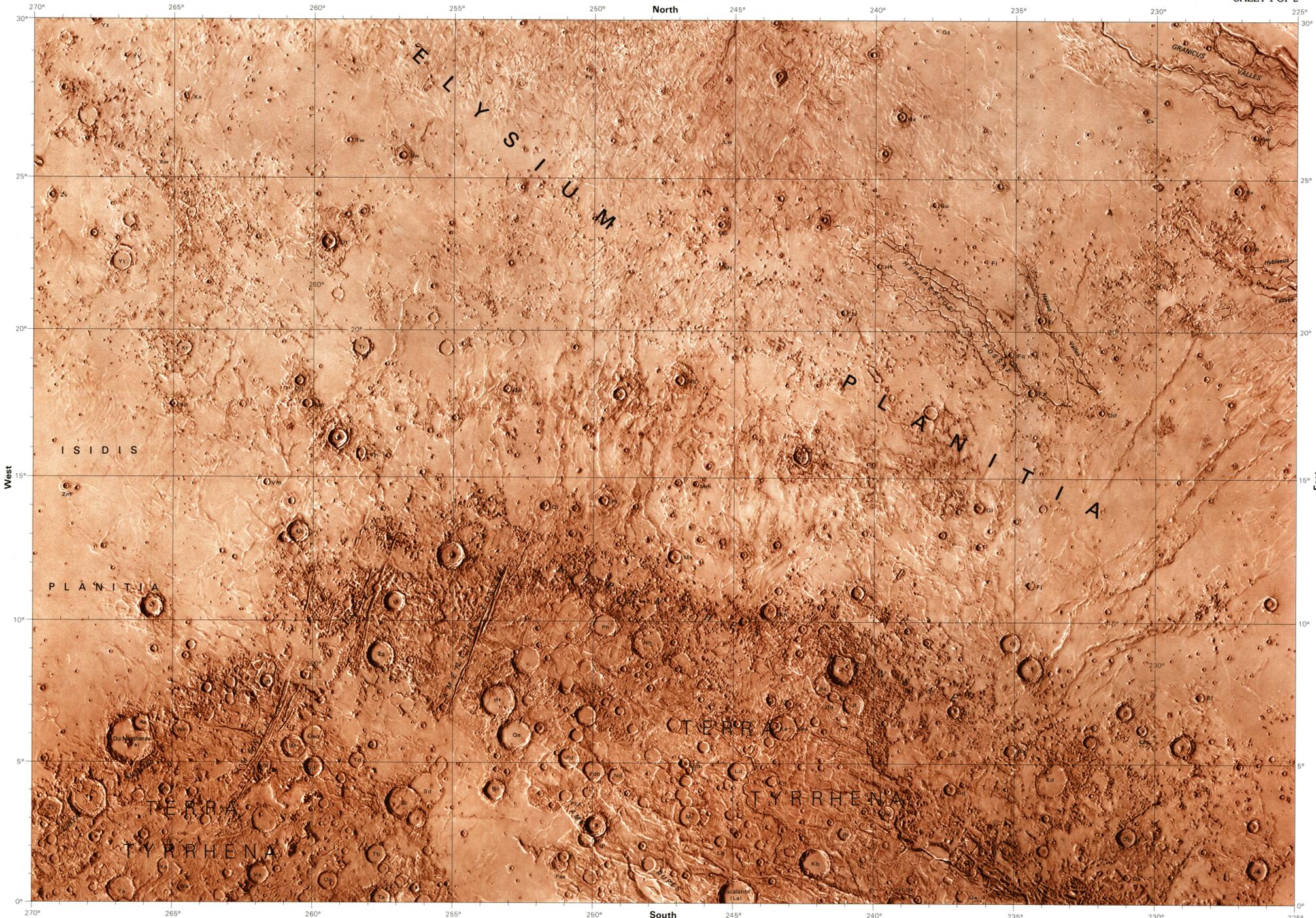
COLOR
No attempt was made on the map to duplicate precisely the color of the Martian surface, although the color used may approximate it.

NOMENCLATURE
Names on this sheet are approved by the International Astronomical Union (IAU, 1974, 1977, 1980, 1983 and 1986). Double- and triple-letter designations for craters refer to position on the map and are derived from a grid based on equidistant meridians and parallels; the alphabet (I and O omitted) runs in the direction of increasing longitude (W) and latitude (N). The complete designation of a crater is the name of the quadrangle followed by a double- or triple letter. The prefix AME (identifying the AMENITHES quadrangle) is part of the complete designation but, for brevity, is not shown on most craters. Some craters have commemorative names; letter designations for these craters are shown in parentheses. Where craters lie mostly on an adjoining map, their letters are derived from the other map; where craters lie exactly on the boundary of two maps, their letters are derived from the eastern or southern map.

MC-14: Abbreviation for Mars Chart 14
M 5M 15/248 RN: Abbreviation for Mars, 1:5,000,000 series; center of sheet, lat 15° N., long 248°; shaded relief map (R) with nomenclature (N).

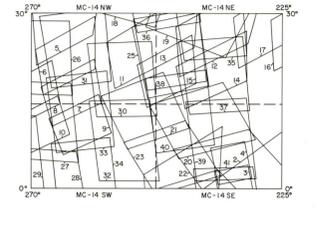
REFERENCES

American Geophysical Union, 1977, Journal of Geophysical Research, v. 82, no. 28, p. 4959-4961.
Batson, R.M., Bridges, P.M., and Inge, J.L., 1979, Atlas of Mars, The 1:5,000,000 map series; National Aeronautics and Space Administration, NASA SP-438, 146 p.
Davies, M.E., 1973, Mariner 9: Primary control net; Photogrammetric Engineering, v. 39, no. 12, p. 1297-1302.
Davies, M.E., and Arthur, D.W.G., 1973, Martian surface coordinates; Journal of Geophysical Research, v. 78, no. 20, p. 4355-4394.
Inge, J.L., 1972, Principles of lunar illustration; Aeronautical Chart and Information Center Reference Publication RP-72-1, 60 p.
Inge, J.L., and Bridges, P.M., 1976, Applied photointerpretation for airbrush cartography; Photogrammetric Engineering and Remote Sensing, v. 42, no. 6, p. 749-760.
International Astronomical Union, 1974, Commission 16: Physical study of planets and satellites, and Lunar and martian nomenclature, in 15th General Assembly, Sydney, 1973, Proceedings: International Astronomical Union Transactions, v. 15B, p. 105-108; 217-221.
1977, Working Group for Planetary System Nomenclature, in 16th General Assembly, Grenoble, 1976, Proceedings: International Astronomical Union Transactions, v. 16B, p. 321-325, 331-336, 355-362.
1980, Working Group for Planetary System Nomenclature, in 17th General Assembly, Montreal, 1979, Proceedings: International Astronomical Union Transactions, v. 17B, p. 293-297.
1983, Working Group for Planetary System Nomenclature, in 18th General Assembly, Patras, 1982, Proceedings: International Astronomical Union Transactions, v. 18B, p. 334-339.
Working Group for Planetary System Nomenclature, in 19th General Assembly, New Delhi, 1986, Proceedings: International Astronomical Union Transactions, v. 19B, p. 347-350.



1:2,000,000 SCALE CONTROLLED PHOTOMOSAICS

Index	Quadrangle No.
11426	MC-14 NE
11427	MC-14 NW
11428	MC-14 SE
11429	MC-14 SW



VIKING 1

Index No.	Picture No.	Index No.	Picture No.
1	101A9	22	741A65
2	101A53	23	741A66
3	456A29	24	741A67
4	456A28	25	765A7
5	700A81	26	798A3
6	700A83	27	798A5
7	700A85	28	798A7
8	700A86	29	798A8
9	700A87	30	800A1
10	700A88	31	800A2
11	700A89	32	800A3
12	700A93	33	800A4
13	700A94	34	800A6
14	700A95	35	800A1
15	700A96	36	802A2
16	704A63	37	802A3
17	704A64	38	802A4
18	723A17	39	802A5
19	723A19	40	802A6
20	741A63	41	802A8
21	741A64	42	802A7

INDEX OF VIKING SOURCES
This shaded relief map has been revised utilizing 1:2,000,000-scale controlled photomosaics and supplementary Viking pictures outlined above. Copies of various enhancements of these pictures are available from National Space Science Data Center, Code 601, Goddard Space Flight Center, Greenbelt, MD 20771.

A-CAMERA PICTURES

Index No.	DAS No.	Index No.	DAS No.
1	8550889	24	7435223
2	8622940	25	7435153
3	7219183	26	7450283
4	7219413	27	8910894
5	7312446	28	7507748
6	8684876	29	7507603
7	7291769	30	7507253
8	7291443	31	7507538
9	7291373	32	7507113
10	7291303	33	7507043
11	7291233	34	7506713
12	7291163	35	7506383
13	8188539	36	7506053
14	7383753	37	7505723
15	7383423	38	7505393
16	7383093	39	7505063
17	7382763	40	7504733
18	7382433	41	7504403
19	7382103	42	7504073
20	8680798	43	7503743
21	7435713	44	7435383
22	7435383	45	7435053
23	7435023	46	7291953

INDEX OF MARINER 9 PICTURES
The mosaic used to control the positioning of features on this map was made with the Mariner 9 A-camera pictures outlined above. Useful coverage is not available in crosshatched areas. The DAS numbers may differ slightly (usually by 5) among various versions of the same picture.



SHADED RELIEF MAP OF THE AMENITHES QUADRANGLE OF MARS

MC-14: REVISED

M 5M 15/248 RN

1987

NOTE 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 454, 2255 North Gemini Drive, Flagstaff, Arizona 86001. A replacement copy will be returned.

For sale by U.S. Geological Survey, Map Distribution, Box 25296, Federal Center, Denver, CO 80225



1:5,000,000
M 5M 15/248 RN
sheet 1
c. 2

M(031)5.1
Am 3hg
sheet 1
c. 2