DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF MARS
1:5,000,000 TOPOGRAPHIC SERIES
LUNAE PALUS QUADRANGLE
M 5M 15/68 RN, 1984
I-1511 (MC-10)

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 that are related to the mapping are described by Batson and others (1979). This revised version was based on Viking Orbiter images. A series of papers describing the Viking mission was published by 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 lats ± 30° and 1:4,290,000 at lats ± 65°. Standard parallels for the Lambert conformal conic projection are at lats ± 35.8° and ± 59.2°. Longitudes increase 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, 1973) and the radio-tracked position of the Mariner 9 spacecraft. The first meridian passes through the center of a small crater, Airy-0 (lat 5.19° S., long 0°), located within the crater Airy.

MAPPING TECHNIQUE

A series of mosaics of Mariner 9 pictures was assembled at 1:5,000,000 using 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 Susan L. Davis.

Revisions were made by Barbara J. Hall.

COLOR

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

NOMENCLATURE

Names on this sheet are approved by the International Astronomical Union (IAU, 1974, 1977, 1980, and 1983) except for provisional names, which are listed below. 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 LUN (identifying the Lunae Palus 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.

Provisional Names: Labeatis Fossa and Sacra Dorsa.

MC-10: Abbreviation for Mars Chart 10.

M 5M 15/68 RN: Abbreviation for Mars, 1:5,000,000 series; center of sheet, lat 15° N., long 68°; shaded relief map (R), with nomenclature (N).

REFERENCES

American Geophysical Union, 1977, Journal of Geophysical Research, v. 82, no. 28, p. 3959-4681.

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.

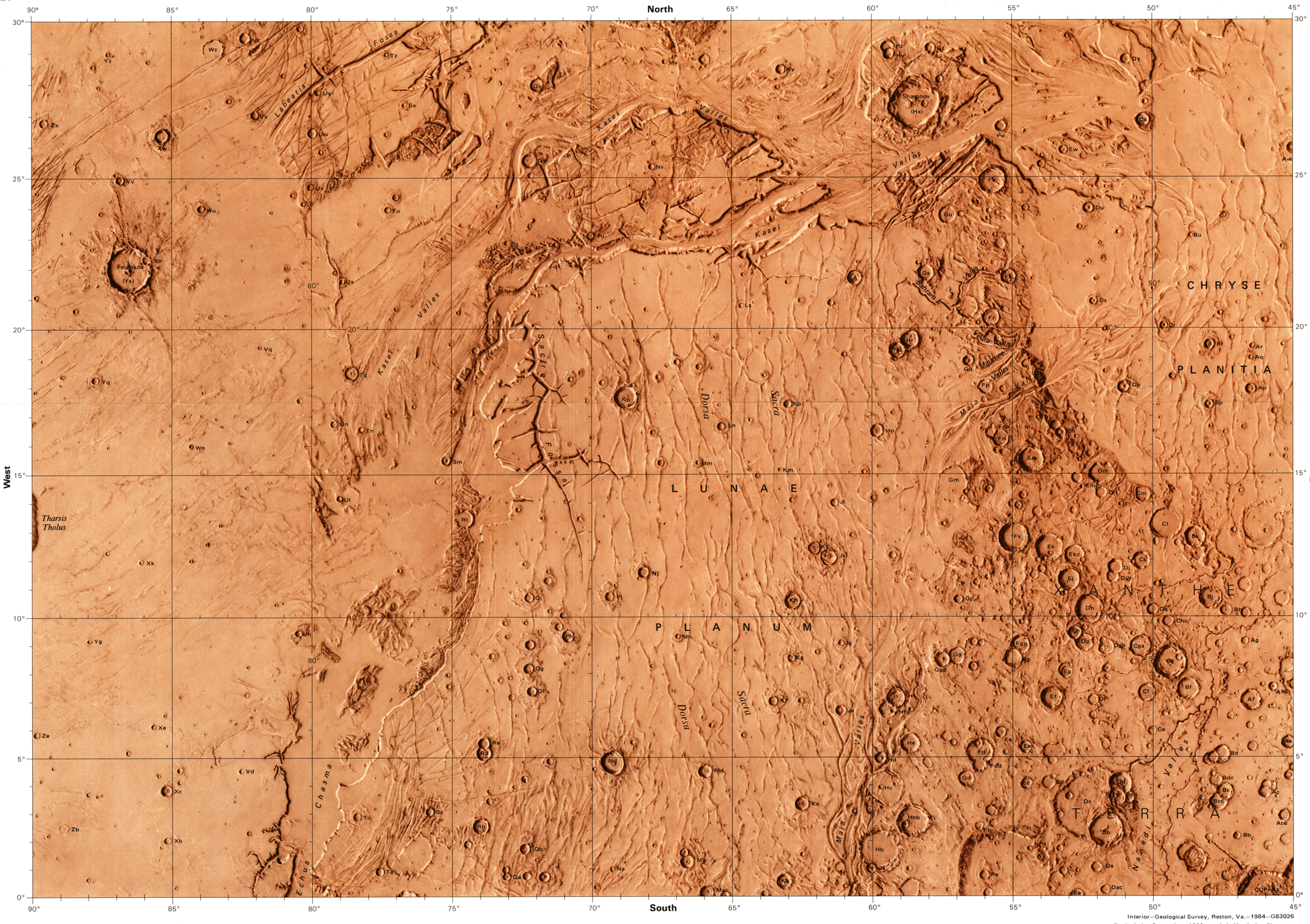
Inge, J. L., and Bridges, P. M., 1976, Applied photointerpretation for airbrush cartography: Photogrammetric Engineering and Remote Sensing, v. 42, no. 6, p. 749-760.

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. 334-336.



Interior—Geological Survey, Reston, Va.—1984—G83026

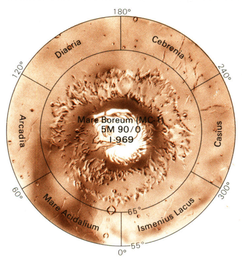
Revised in September 1982 on behalf of the Planetary Geology Program, Planetary Division, Office of Space Science, National Aeronautics and Space Administration under contract W-13,709

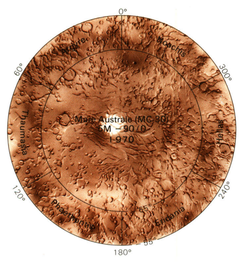
This map supersedes I-925, the first edition of this sheet.

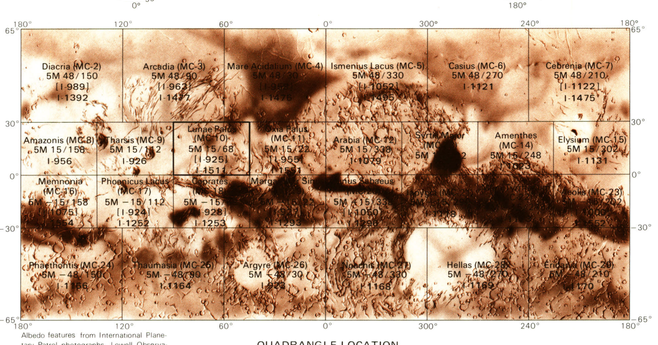
SCALE 1:5 000 000 (1 mm = 5 km) AT 0° LATITUDE
MERCATOR PROJECTION

100 50 0 KILOMETERS 100 200 300 400 500 600 700 800 900 1000

30°
20°
10°
0°







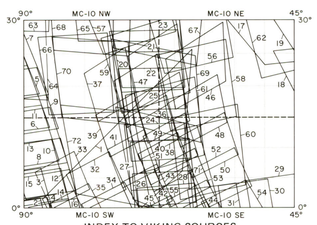
Albedo features from International Planetary Patrol photographs, Lowell Observatory, Flagstaff, Ariz.

QUADRANGLE LOCATION

Number preceded by I refers to published shaded relief map. [Number in brackets refers to earlier map superseded by revised version.]

1:2,000,000 Controlled photomosaics

I-No.	Quadrangle No.
I-1303	MC-10 NW
I-1305	MC-10 NE
I-1306	MC-10 SW
I-1307	MC-10 SE

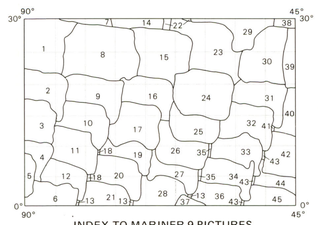


INDEX TO VIKING SOURCES

This shaded relief map has been revised utilizing 1:2,000,000 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.

Viking 1

Index No.	DAS No.	Index No.	DAS No.	Index No.	DAS No.
1	40A83	25	482A11	49	684A64
2	444A12	26	482A12	50	684A65
3	444A13	27	482A13	51	684A66
4	444A15	28	482A15	52	684A67
5	444A22	29	482A21	53	684A68
6	444A24	30	482A23	54	684A69
7	444A25	31	482A25	55	684A70
8	444A26	32	682A25	56	747A05
9	444A27	33	682A26	57	747A06
10	444A28	34	682A27	58	747A07
11	444A29	35	682A28	59	747A08
12	444A30	36	684A41	60	747A09
13	444A31	37	684A42	61	747A10
14	444A32	38	684A43	62	750A20
15	444A33	39	684A44	63	816A07
16	444A35	40	684A45	64	816A09
17	450A01	41	684A46	65	818A09
18	450A02	42	684A47	66	818A12
19	450A03	43	684A48	67	854A15
20	482A06	44	684A49	68	854A16
21	482A07	45	684A50	69	854A17
22	482A08	46	684A61	70	854A18
23	482A09	47	684A62	71	854A19
24	482A10	48	684A63	72	854A20



INDEX TO 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. The DAS number may differ slightly (usually by 5) among various versions of the same picture.

A-camera pictures

Index No.	DAS No.	Index No.	DAS No.
1	07255813	24	07471343
2	07255463	25	07471273
3	07255393	26	07471203
4	07255673	27	07471133
5	07255253	28	07471063
6	07327143	29	08074779
7	07255953	30	07543583
8	07327773	31	07543233
9	07327423	32	07543163
10	07327353	33	07543093
11	07327283	34	07543023
12	07327213	35	07471558
13	05380798	36	07542953
14	08730859	37	06139738
15	07399733	38	08946669
16	07399383	39	07615473
17	07399313	40	07615053
18	07327638	41	07543518
19	07399243	42	07614983
20	07399173	43	07543448
21	07399103	44	07614913
22	08802819	45	07614843
23	07471693		

SHADED RELIEF MAP OF THE LUNAE PALUS QUADRANGLE OF MARS

MC-10
M 5M 15/68 RN
1984

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.

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