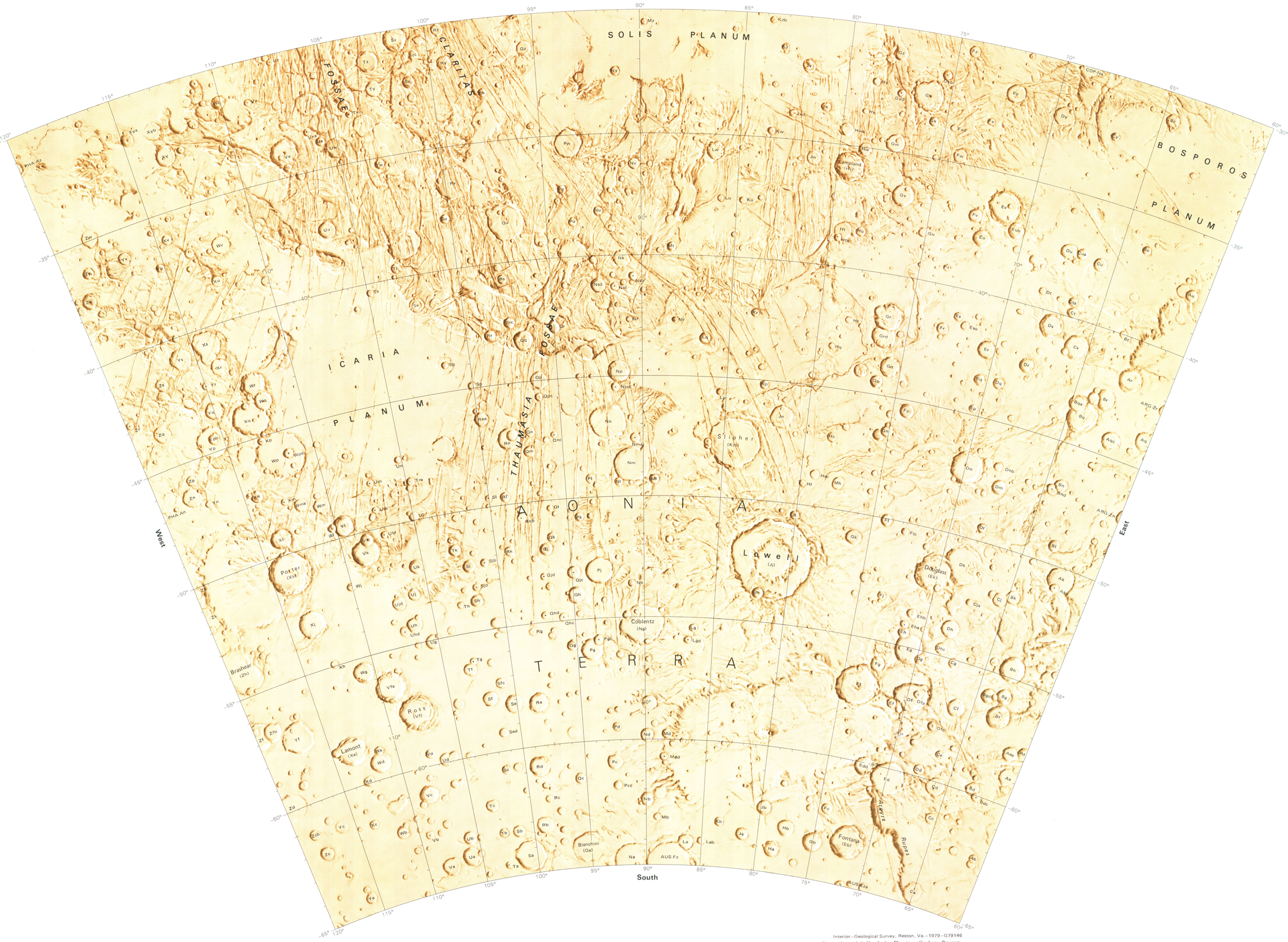
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

ATLAS OF MARS
1:5 000 000 TOPOGRAPHIC SERIES
THAUMASIA QUADRANGLE
M 5M –48/90 R, 1979
I-1164 (MC-25)

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



Interior—Geological Survey, Reston, Va.—1979—G79146

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

NOTES ON BASE

This is one map in a series of topographic map sheets covering the entire surface of Mars at nominal scales of 1:25 000 000 and 1:5 000 000 (Batson, 1973, 1976). The major sources of map data were the Mariner 9 television experiment (Masursky and others, 1970) and Viking Orbiter pictures.

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 and a polar radius of 3375.7 km.

PROJECTION

The Lambert conformal conic projection is used for this sheet with standard parallels at –35.8° and –59.2°. A scale of 1:4 336 000 at lat –30° was chosen to match the scale at lat –30° of the adjacent Mercator projections. Longitudes increase to the west in accordance with usage of the International Astronomical Union (IAU, 1971). Latitudes are areographic (de Vaucouleurs and others, 1973).

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 spacecraft. The first meridian passes through the crater Airy-O (lat –5.19°) within the crater Airy. No simple statement is possible for the precision, but local consistency is about 10 km.

MAPPING TECHNIQUE

A series of mosaics of Lambert conformal conic projections of Mariner 9 pictures was assembled at 1:5 000 000.

Shaded relief was portrayed with uniform illumination with the sun to the west, using airbrush techniques described by Inge (1972) and Inge and Bridges (1976). Sizes, shapes, and positions of features were taken from the base mosaic. Various computer enhancements of many Mariner 9 and Viking Orbiter pictures besides those in the base mosaic were examined in an attempt to portray the surface as accurately as possible. (Computer enhancement of Mariner 9 pictures is described by Levinthal and others, 1973, and Green and others, 1975.)

Shaded relief analysis and representation 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 does approximate it.

NOMENCLATURE

All names on this sheet are approved by the International Astronomical Union (IAU, 1974, 1980). 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 double or triple letters. The prefix THU (identifying the Thaumasia 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-25: Abbreviation for Mars Chart 25.

M 5M –48/90 R: Abbreviation for Mars 1:5 000 000 series; center of sheet, lat –48°, long 90°; shaded relief map, R.

REFERENCES

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Green, W. B., Jepsen, P. L., Kreznar, J. E., Ruiz, R. M., Schwartz, A. A., and Seidman, J. B., 1975, Removal of instrument signature from Mariner 9 television images of Mars: Applied Optics, v. 14, no. 1, p. 105-114.

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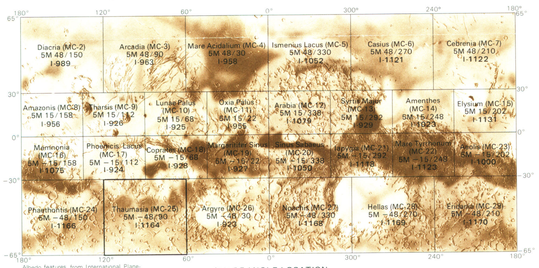
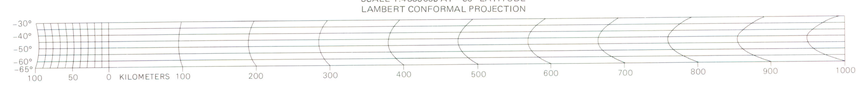


Albedo features from International Planetary Patrol photographs, Lowell Observatory, Flagstaff, Ariz.

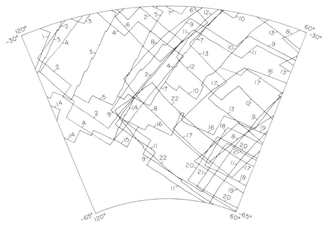
QUADRANGLE LOCATION
Number preceded by I refers to published shaded relief map

SCALE 1:4 336 000 AT –30° LATITUDE
LAMBERT CONFORMAL PROJECTION



NOTE TO USERS

Users noting errors or omissions are urged to indicate them on the map and to forward it to Astrogeologic Studies, Geologic Division, 2255 North Gemini Drive, Flagstaff, Arizona 86001. A replacement copy will be returned.



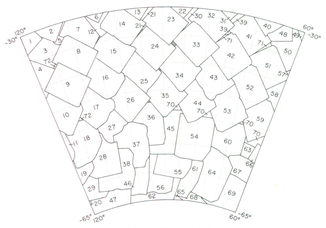
SUPPLEMENTAL SOURCE INDEX
Viking pictures were used where available to clarify Mariner 9 data. The outline for each sequence of pictures is shown.

Viking 1

Index No.	Picture No.	Index No.	Picture No.	Index No.	Picture No.	Index No.	Picture No.
1	56A39	5	57A09	9	34A22	14	53A34
	56A41		57A10		34A23		53A35
2	34A42		57A11	10	67A02		53A39
	34A43		57A12		67A03		53A40
	34A44		57A13		67A04		53A41
	34A45	6	40A81		67A05		53A42
	34A46	7	63A06		67A06		53A43
3	56A61		63A07		67A07		53A44
	56A62		63A08		67A08	15	63A01
	56A63		63A09		67A09		63A03
	56A64		63A10		67A10	16	53A45
	56A65		63A11		67A11		53A46
	56A66		63A12		67A12		53A47
	56A67		63A13		67A13		53A48
	56A68		63A14		67A14		53A49
	56A69		63A15		67A15		53A50
	56A70		63A16		67A17		53A51
	56A72		63A17	11	34A35		53A53
4	34A24		63A19		34A36		53A55
	34A25	8	40A53		34A37		53A57
	34A26		40A54		34A38		53A59
	34A27		40A55		34A39		53A61
	34A28		40A56		34A40		53A63
5	57A02		40A57		34A41	17	40A67
	57A03		40A58	12	40A70		40A69
	57A04	9	34A17		40A71	18	22A95
	57A05		34A18		40A72	19	40A62
	57A06		34A19	13	40A09	20	34A12
	57A07		34A20		40A10	21	34A30
	57A08		34A21	14	53A33		

Viking 2

Index No.	Picture No.
22	59B08
	59B10
	59B12
	59A14
	59A16



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. Useful coverage is not available in the cross-hatched areas. 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.	Index No.	DAS No.	Index No.	DAS No.
1	8585259	19	5922663	37	6066583	55	6210363
2	5779373	20	5922593	38	6066513	56	6210293
3	5779303	21	8801209	39	8945059	57	6282813
4	5779233	22	5995323	40	6139173	58	6282743
5	8657219	23	5995253	41	6139103	59	6282673
6	5851403	24	5995183	42	6139033	60	6282323
7	5851333	25	5995113	43	6138963	61	6282183
8	5851263	26	5995043	44	6138893	62	6282113
9	5851193	27	5994693	45	6138543	63	6354143
10	5851123	28	5994623	46	6138403	64	6354073
11	5850773	29	5994553	47	6138333	65	6354003
12	8729249	30	8873169	48	9016949	66	6426033
13	5923363	31	6067283	49	6211063	67	6425963
14	5923293	32	6067213	50	6210993	68	6425893
15	5923223	33	6067143	51	6210923	69	6497783
16	5923153	34	6067073	52	6210853	70	5380583
17	5923083	35	6067003	53	6210783	71	5452683
18	5922733	36	6066653	54	6210433	72	5236873

SHADED RELIEF MAP OF THE THAUMASIA QUADRANGLE OF MARS

MC-25
M 5M –48/90 R
1979

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