DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared in Cooperation with the
JET PROPULSION LABORATORY CALIFORNIA INSTITUTE OF TECHNOLOGY
FOR THE LANGLEY RESEARCH CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF MARS
1:5,000,000 TOPOGRAPHIC SERIES
AEOLIS QUADRANGLE
M 5M –15/202 RMC.1976
I-1001 (MC-23)

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). The major source of map data was the Mariner 9 television experiment (Masursky and others, 1970).

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 projection is used for this sheet, with a scale of 1:5,000,000 at the equator and 1:4,336,000 at lat 30°. 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° S) 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 Mercator projections of Mariner 9 pictures was assembled at 1:5,000,000.

Shaded relief was copied from the mosaics and portrayed with uniform illumination with the sun to the west. Many Mariner 9 pictures besides those in the base mosaic were examined to improve the portrayal (Levinthal and others, 1973). The shading is not generalized and may be interpreted with photographic reliability (Inge, 1972).

Shaded relief analysis and representation were made by Jay L. Inge.

ALBEDO MARKINGS

The markings superimposed on the shaded relief were hand copied from pictures that were computer enhanced especially to show low frequency tone variation (Batson and Inge, 1976). The surface in these pictures is illuminated from a variety of angles from the camera line of sight. The markings therefore delineate boundaries of local brightness variations only and should not be considered as a true measure of albedo. No attempt was made to use Earth based telescopic albedo data.

Airbrush portrayal of albedo markings was done by Jay L. Inge.

CONTOURS

Since Mars has no seas and hence no sea level, the datum (the 0 km contour line) for altitudes is defined by a gravity field described by spherical harmonics of fourth order and fourth degree (Jordan and Lorell, 1973) combined with a 6.1 millibar atmospheric pressure surface derived from radio-occultation data (Kliore and others, 1973; Christensen 1975). This datum is a triaxial ellipsoid with semi-major axes of A=3394.6 km, B=3393.3 km, and a semi-minor axis of C=3376.3 km. The semi-major axis A intersects the Martian surface at long 105°.

The contour lines (Wu, 1975) were compiled from Earth-based radar determinations (Downs and others, 1971; Pettengill and others, 1971) and measurements made by Mariner 9 instrumentation, including the ultraviolet spectrometer (Hord and others, 1974), infrared interferometer spectrometer (Conrath and others, 1973), and stereoscopic Mariner 9 television pictures (Wu and others, 1973).

Formal analysis of contour-line accuracy has not been made. The estimated vertical accuracy of each source of data indicates a probable error of 1-2 km.

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

All names on this sheet are approved by the International Astronomical Union (IAU, 1974), except the following names which are proposed: Aeolis Mensae, Gusev, Lasswitz, and Wien. Double and triple letter designations for craters refer to position on the map. 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-23: Abbreviation for Mars Chart 23.
M 5M –15/202 RMC: Abbreviation for Mars 1:5,000,000 series; center of sheet, 15° S latitude, 202° longitude; shaded relief map, R, with albedo markings, M, and contours, C.

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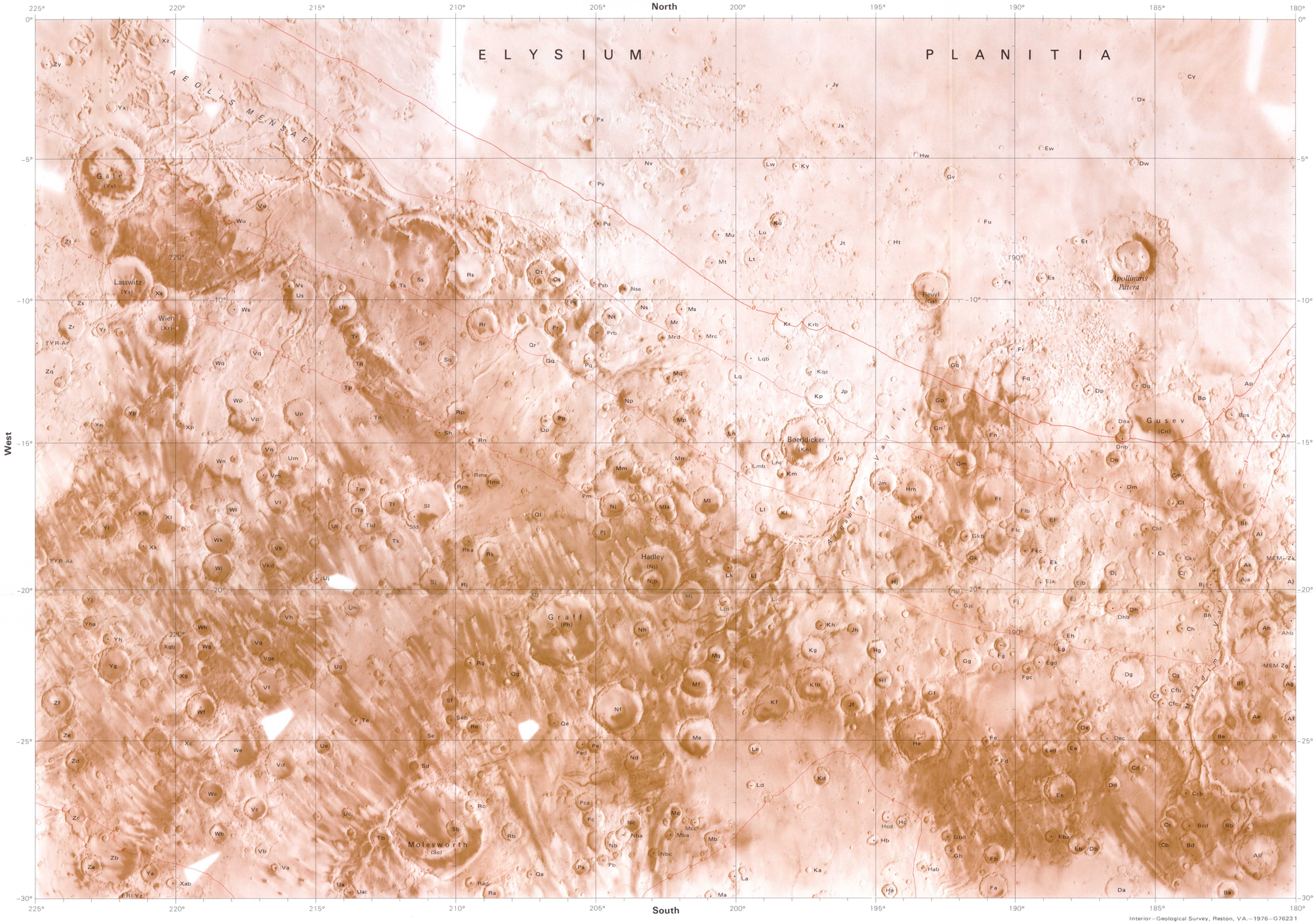
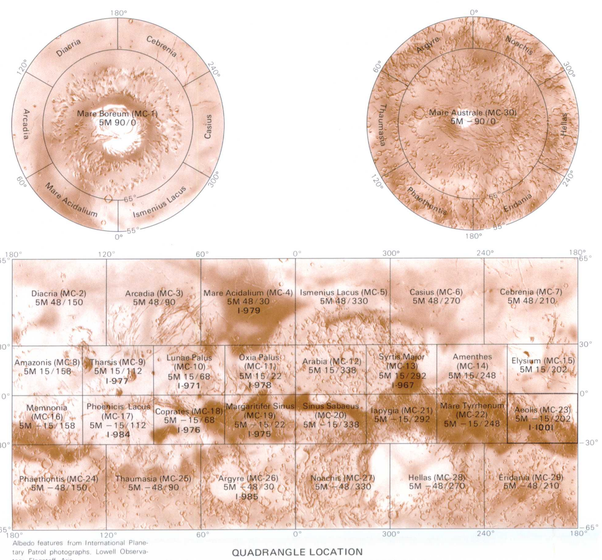
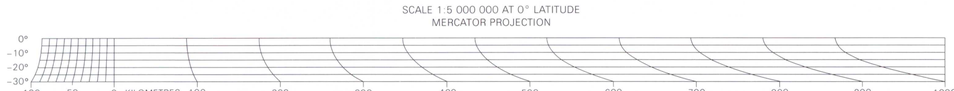


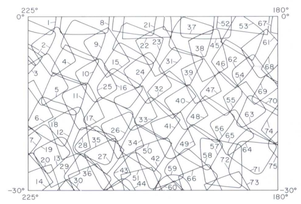


QUADRANGLE LOCATION
Number preceded by I refers to published topographic map

SCALE 1:5 000 000 AT 0° LATITUDE
MERCATOR PROJECTION



CONTOUR INTERVAL 1 KILOMETRE



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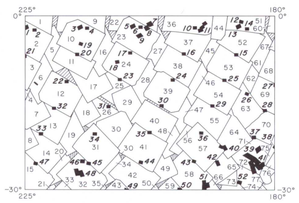
2	7650473	28	6390893	54	7937963
3	7650403	29	6390823	55	7937893
4	9125169	30	6390753	56	7937823
5	9125099	31	9268949	57	7937753
6	9125029	32	9268879	58	6534603
7	9124959	33	9268809	59	3827080
8	7722713	34	9268739	60	6534533
9	7722363	35	9268669	61	8009783
10	7722293	36	9268599	62	8009713
11	7722223	37	7866493	63	8009643
12	7722153	38	7866143	64	8009573
13	6319003	39	7866073	65	9484199
14	6318933	40	7866003	66	8009433
15	9197059	41	7865933	67	6607333
16	9196989	42	7865863	68	6606913
17	9196919	43	6462713	69	6606843
18	9196849	44	6462643	70	6606773
19	9196779	45	12326301	71	6606702
20	9196709	46	9340839	72	9412799
21	7794603	47	9340769	73	5203413
22	12985633	48	9340699	74	8081463
23	7794253	49	9340629	75	8081393
24	7794183	50	9340559		
25	7794113	51	9340489		
26	7794043	52	7938383		

INDEX TO MARINER 9 PICTURES USED
TO MAKE THE ALBEDO MARKINGS OVERLAY

Most of the pictures indexed above were specially processed to accentuate albedo markings. Only the useful image areas of the pictures are outlined.



A-camera pictures

Index No.	DAS No.	Index No.	DAS No.	Index No.	DAS No.
1	7650823	27	9268949	53	7937963
2	7650473	28	9268879	54	7937893
3	7650403	29	9268809	55	7937823
4	7650333	30	9268739	56	7937753
5	9125169	31	6390893	57	6534673
6	9125099	32	6390823	58	6534603
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9	7722713	35	9268599	61	8009783
10	7722363	36	7866493	62	8009713
11	7722293	37	7866143	63	8009643
12	7722223	38	7866073	64	8009573
13	7752153	39	7866003	65	8009503
14	6319003	40	7865933	66	8009433
15	6318933	41	7865863	67	6606983
16	9197059	42	6462713	68	6606913
17	9196989	43	6462643	69	6606843
18	9196919	44	12326301	70	6606773
19	9196849	45	9340839	71	6606703
20	9196779	46	9340769	72	5293483
21	9196709	47	9340699	73	9484199
22	7794603	48	9340629	74	9412799
23	7794253	49	9340559	75	8081393
24	7794183	50	9340489	76	6678593
25	7794113	51	7938383	77	5275373
26	7794043	52	7938033		

High-resolution B-camera pictures

Index No.	DAS No.	Index No.	DAS No.	Index No.	DAS No.
1	7650788	25	7937928	45	6390858
2	7650508	26	8009678	46	7793928
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6	7794288	30	7865968	49	6462678
7	12985458	31	7794078	50	6534568
8	12985388	32	7722188	51	9412134
9	12985598	33	7722118		9412064
10	7866178	34	7794008		9412204
11	12326126	35	7865898	52	5203448
	12326056	36	7937788		
	12326266	37	6606738		
12	9341014	38	8081428		
13	7938348	39	9412834		
14	7938068	40	9484234		
15	7937998		8009538		
16	7866108	41	9628224		
17	7794218		9628154		
18	9197234		9412764		
19	9125224		9628084		
20	7722328		8152968		
21	7650438		8153038		
22	7722258	42	9484164		
23	7794148	43	6534638		
24	7866038	44	6462748		

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 some cross-hatched areas. Pictures other than those shown in the mosaic were used for portrayal in the other cross-hatched areas. Also shown (by solid black rectangles) are the high-resolution B-camera pictures, identified by italic numbers.

TOPOGRAPHIC MAP OF THE AEOLIS QUADRANGLE OF MARS

MC-23

M 5M –15/202 RMC

1976

Interior—Geological Survey, Reston, VA.—1976—G76231

Prepared on behalf of the Viking Project Office, National Aeronautics and Space Administration under contract L-55232

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