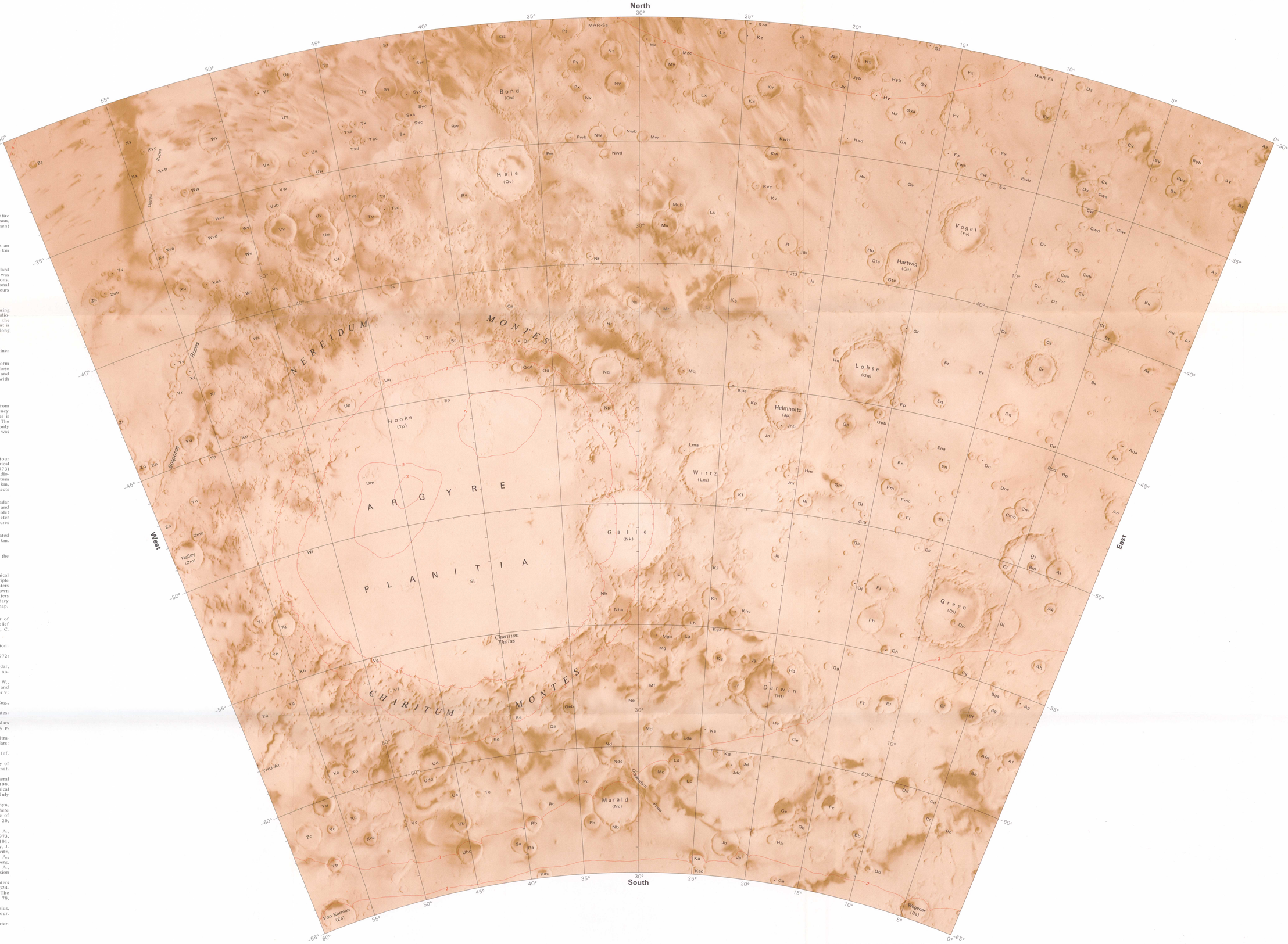
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

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

ATLAS OF MARS
1:5,000,000 TOPOGRAPHIC SERIES
ARGYRE QUADRANGLE
M 5M −48/30 RMC, 1976
I-985 (MC-26)



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 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° S) within the crater Airy. No simple statement is possible for the precision, but local consistency is 10-15 km, except along the northern edge where inconsistencies as large as 20 km exist.

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 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; Millman, written commun., 1975). 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-26: Abbreviation for Mars Chart 26.
M 5M −48/30 RMC: Abbreviation for Mars 1:5,000,000 series; center of sheet, 48° S latitude, 30° longitude; shaded relief map, R, with albedo markings, M, and contours, C.

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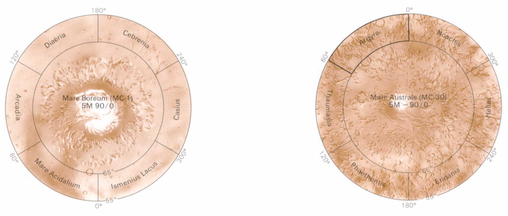
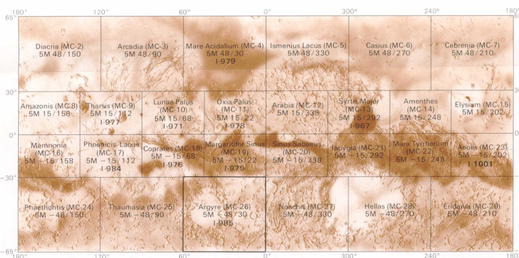


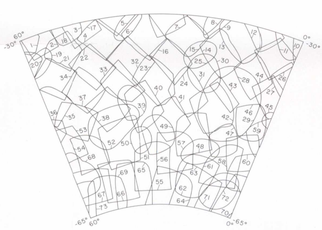


QUADRANGLE LOCATION
Number preceded by I refers to published topographic map

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

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

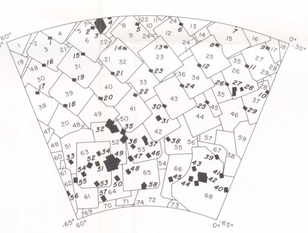
CONTOUR INTERVAL 1 KILOMETRE



INDEX OF 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.

Index No.	DAS No.	Index No.	DAS No.	Index No.	DAS No.
1	6211063	26	5239323	50	5166873
2	9088839	27	5311213	51	6497993
3	6282953	28	5239253	52	6856743
4	9160729	29	5884723	53	5452613
5	6354843	30	5167293	54	6426103
6	9232619	31	5167223	55	5238763
7	9304509	32	6499413	56	5238833
8	6498623	33	6426523	57	5812623
9	7972453	34	6354633	58	5382753
10	8117303	35	6282743	59	5382963
11	5239393	36	6282673	60	5454643
12	8045413	37	6354563	61	5382683
13	5167433	38	6426453	62	5382613
14	5167363	39	5597793	63	5454503
15	6498553	40	6498343	64	5383543
16	6426663	41	5167153	65	5238963
17	6354773	42	5239113	66	5166809
18	6282883	43	5238183	67	6497853
19	5524713	44	5311143	68	6426033
20	6210993	45	6028643	69	5166733
21	6282813	46	5311073	70	5526533
22	6354703	47	5310583	71	5454573
23	6426593	48	5238903	72	5598493
24	6498483	49	5166943	73	6497783
25	5812693				



A-camera pictures

Index No.	DAS No.	Index No.	DAS No.	Index No.	DAS No.
1	6211063	27	5239323	53	5166943
2	9088839	28	6028433	54	5238833
3	6282883	29	5311213	55	5238903
4	6282953	30	6282813	56	5956813
5	9160729	31	6354703	57	5310863
6	6354773	32	6426593	58	5382753
7	6354843	33	6498413	59	5382963
8	9232619	34	5167293	60	6426033
9	6426663	35	6028573	61	6497853
10	9304509	36	5812623	62	6497923
11	6426733	37	5311143	63	6497923
12	6498553	38	6282743	64	5166803
13	6498623	39	6354633	65	5238763
14	7973453	40	6426523	66	5382613
15	5167433	41	6498343	67	5382683
16	8045413	42	5167153	68	7432703
17	5239393	43	5167223	69	5166733
18	8117303	44	5239113	70	5094703
19	6210993	45	5239183	71	5238693
20	6354563	46	5311073	72	5382543
21	5596873	47	6282673	73	5454503
22	5957873	48	5596603	74	5740523
23	6498483	49	6426453		
24	5812693	50	6856743		
25	5167363	51	6426103		
26	5239253	52	6497993		

High resolution B-camera pictures

Index No.	DAS No.	Index No.	DAS No.	Index No.	DAS No.
1	*6282918*	*26*	*5239218*	*43*	*5382648*
2	*6354808*	*27*	*6045028*	*44*	*6785448*
3	*8403854*		*8045098*	*45*	*5382578*
4	*9204264*		*8044958*	*46*	*5238798*
5	*9304194*	*28*	*8045168*	*47*	*5094878*
6	*6426698*	*29*	*5311108*	*48*	*5238728*
7	*6498588*	*30*	*5167188*	*49*	*7144898*
8	*9232618*	*31*	*5095018*		*8259724*
9	*5167398*	*32*	*5597828*		*6858848*
10	*5239358*		*5597898*		*8259794*
11	*5311178*		*8547914*		*6569638*
12	*5239288*	*33*	*6426068*		*6856778*
13	*5167328*	*34*	*6497958*		*7144548*
14	*6498518*	*35*	*8519374*		*5166838*
15	*6426628*		*8259864*		*7144828*
16	*6354738*	*36*	*5166908*	*50*	*5094808*
17	*6282848*	*37*	*5094948*	*51*	*7757188*
18	*6282778*		*5094703*	*52*	*9519304*
19	*6354598*	*38*	*5238868*	*53*	*5166768*
20	*6354668*	*39*	*5382718*	*54*	*6497888*
21	*6426488*	*40*	*5526568*	*55*	*7900688*
22	*6426558*	*41*	*5454608*	*56*	*6497818*
23	*6498378*	*42*	*7432738*	*57*	*5094738*
24	*6498448*		*7432808*	*58*	*6641878*
25	*5167258*		*7432458*		*6641598*
26	*5239148*		*5454538*		

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, identified by vertical numbers. Also shown (by solid black rectangles) are the high resolution B-camera pictures, identified by italic numbers.

TOPOGRAPHIC MAP OF THE ARGYRE QUADRANGLE OF MARS

MC-26
M 5M −48/30 RMC
1976

Interior—Geological Survey, Reston, Va.—1976—G76139

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