

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 (Bates and others, 1979). This original series is now being revised and augmented through use of image data from Viking Orbiter. This sheet was compiled exclusively from Viking pictures. 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 3372.7 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. 120° and 1:4,306,000 at lat. 165°. Standard parallels for the Lambert Conformal Conic projection are at lat. 33.8° and 129.2°. Longitude increases to the west in accordance with astronomical convention for Mars.

CONTROL

Image placement is based on the 1978 control net (Davies and others, 1978). The first meridian passes through the center of a small crater, Aryo O (lat. 5.19° S., long. 0°), located within the crater Ary.

MAPPING TECHNIQUE

A mosaic of Viking Orbiter pictures was assembled at 1:5,000,000 scale based on the Polar Stereographic projection. Precise geometric transformations of the highly oblique Viking Orbiter pictures taken in the polar regions is not possible, however. Discrepancies between adjacent frames are therefore as great as 4.5 mm, primarily in the east-west direction.

Shaded relief was portrayed by use of airbrush techniques detailed by Inge (1972) and photometer-prover methods described by Inge and Bridges (1976). Uniform sun illumination directions were used throughout. Sizes, shapes, and positions of features were taken from the base mosaic. Various computer enhancements of many Viking Orbiter pictures besides those in the base mosaic were examined in an attempt to portray the surface as accurately as possible. Shaded relief analysis and representation were made by Patricia M. Bridges and 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.

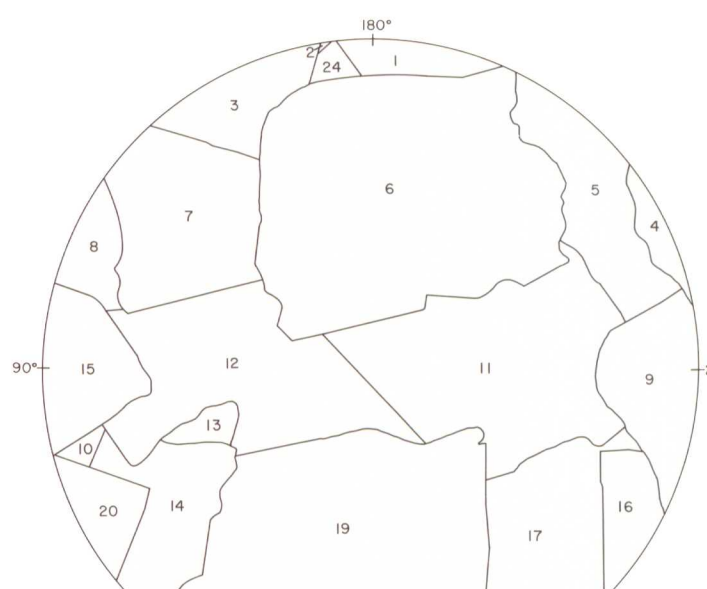
NOMENCLATURE

Names on this sheet are approved by the International Astronomical Union (IAU, 1974, 1977, 1986 and 1988). 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 BORE identifies the MARE BOREUM region; it 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.

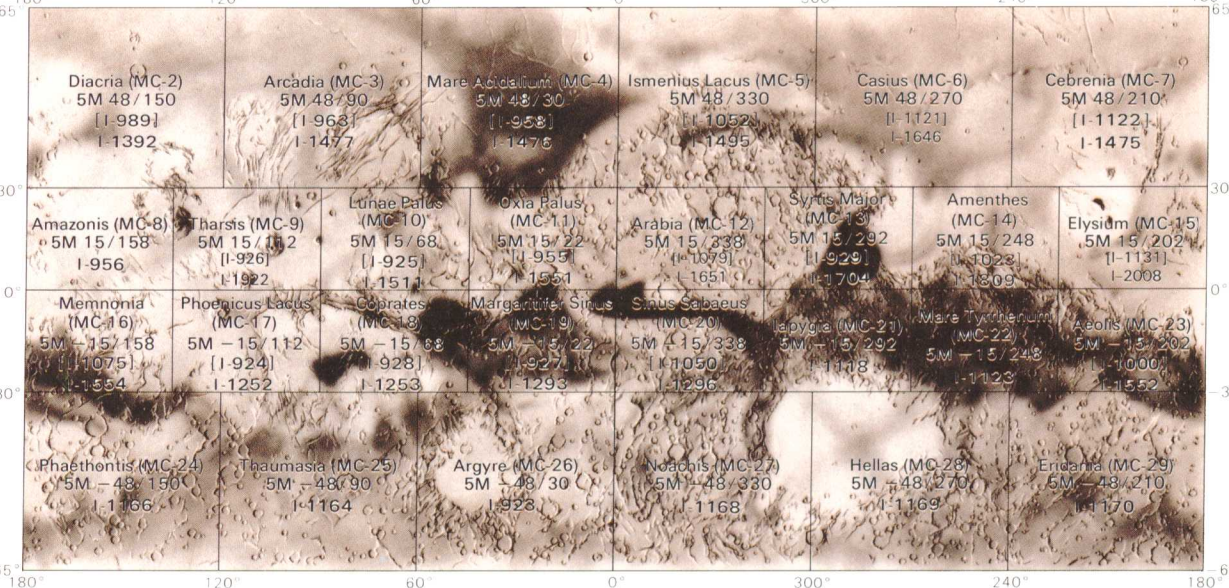
MC-1: Abbreviation for Mars Chart 1 M 5M 90/0 2RN
1:5,000,000 series, center of sheet, lat. 90° N., long. 0°; second edition; shaded relief map (R) with nomenclature (N).

REFERENCES

- American Geophysical Union, 1977, Journal of Geophysical Research, v. 82, no. 26, p. 3959-4061.
- Bates, 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 Special Publication 438, 146 p.
- Davies, M.E., Kellogg, C.V., and Roth, J.A., 1978, Control net of Mars, February 1978, The Rand Corporation, R-2309-NASA, 91 p.
- Inge, J.L., 1972, Principles of lunar illustrations: Aeronautical Chart and Information Center Reference Publication 72-1, 60 p.
- Inge, J.L., and Bridges, P.M., 1976, Applied photogrammetry 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 planetary nomenclature, in 5th 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. 14B, p. 321-325, 331-336, 355-362.
- 1986, Working Group for Planetary System Nomenclature, in 19th General Assembly, New Delhi, 1985, Proceedings: International Astronomical Union, Transactions, v. 19B, p. 361-366.
- 1988, Working Group for Planetary System Nomenclature, in Reports on Astronomy: International Astronomical Union, Transactions, v.20A, p. 794-795.



The mosaic used to control the positioning of features on this map was made with the Mariner 9 camera pictures outlined above. The DAS number may differ slightly (usually by 5) among various versions of the same picture.



Albedo: Values from International Photo Key; Picture photographs: Lowell Observatory; Photograph: Air.

Number preceded by # refers to published shaded relief map
(Number in brackets refers to earlier map superseded by revised version 1)

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.

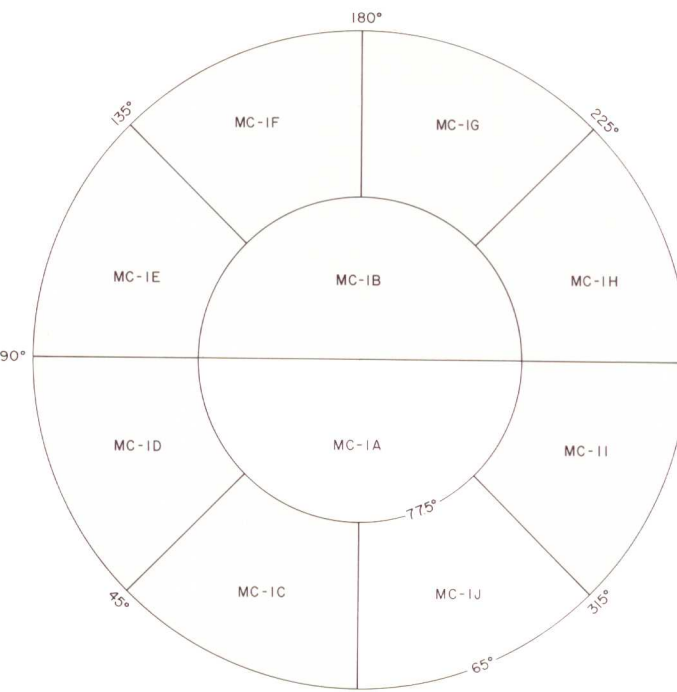
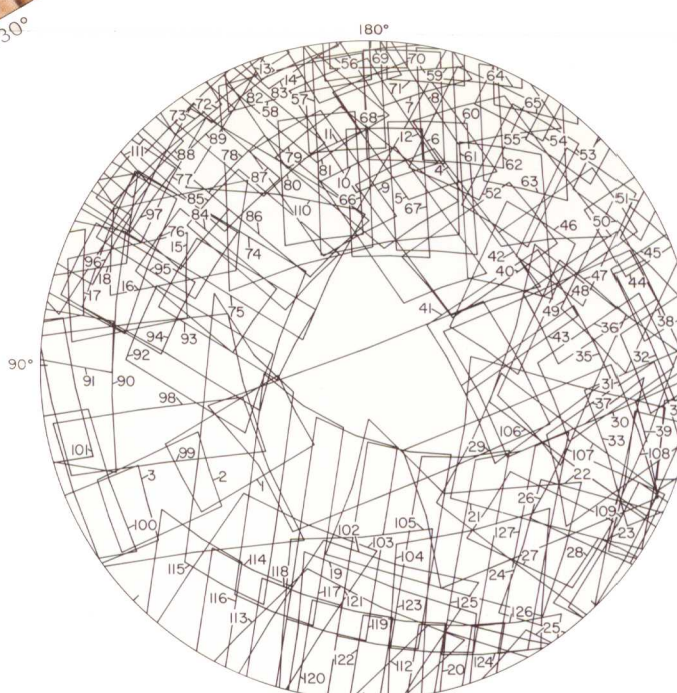
NOTES—GEOLOGICAL SURVEY NOTES 61-188
Prepared on behalf of the Planetary Geology and Geophysics Program, Office of Space Science and Applications, National Aeronautics and Space Administration, under contract DS-25-14. This map supersedes I-1876 (the first edition of this sheet).

VIKING 1

Index No.	Picture No.	Index No.	Picture No.
1	710375	43	804272
2	710382	44	804273
3	710402	45	804274
4	710408	46	804275
5	710421	47	804276
6	710423	48	804277
7	710424	49	804278
8	710425	50	804279
9	710426	51	804280
10	710441	52	804281
11	710442	53	804282
12	710443	54	804283
13	710444	55	804284
14	710445	56	804285
15	710446	57	804286
16	710447	58	804287
17	710448	59	804288
18	710449	60	804289
19	710450	61	804290
20	710451	62	804291
21	710452	63	804292
22	710453	64	804293
23	710454	65	804294
24	710455	66	804295
25	710456	67	804296
26	710457	68	804297
27	710458	69	804298
28	710459	70	804299
29	710460	71	804300
30	801401	72	810276
31	801402	73	810277
32	801404	74	810278
33	801405	75	810279
34	801406	76	810280
35	801407	77	810281
36	801408	78	810282
37	801409	79	810283
38	801410	80	810284
39	801411	81	810285
40	801412	82	810286
41	801413	83	810287
42	801414	84	810288
43	801415	85	810289
44	801416	86	810290
45	801417	87	810291
46	801418	88	810292
47	801419	89	810293
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49	801421	91	810295
50	801422	92	810296
51	801423	93	810297
52	801424	94	810298
53	801425	95	810299
54	801426	96	810300
55	801427	97	810301
56	801428	98	810302
57	801429	99	810303
58	801430	100	810304
59	801431	101	810305
60	801432	102	810306
61	801433	103	810307
62	801434	104	810308
63	801435	105	810309
64	801436	106	810310
65	801437	107	810311
66	801438	108	810312
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68	801440	110	810314
69	801441	111	810315
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72	801444	114	810318
73	801445	115	810319
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78	801450	120	810324
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80	801452	122	810326
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83	801455	125	810329
84	801456	126	810330
85	801457	127	810331
86	801458	128	810332
87	801459	129	810333
88	801460	130	810334
89	801461	131	810335
90	801462	132	810336
91	801463	133	810337
92	801464	134	810338
93	801465	135	810339
94	801466	136	810340
95	801467	137	810341
96	801468	138	810342
97	801469	139	810343
98	801470	140	810344
99	801471	141	810345
100	801472	142	810346

1:2,000,000 SCALE CONTROLLED PHOTOMOSAICS

Index No.	Quadrangle No.
1170	MC-1 A B
1180	MC-1 C
1190	MC-1 D
1200	MC-1 E
1210	MC-1 F
1220	MC-1 G
1230	MC-1 H
1240	MC-1 I
1250	MC-1 J



This shaded relief map has been revised by using 1:2,000,000 scale controlled photomosaics and the 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.

For sale by U.S. Geological Survey, Map Distribution, Box 2320B, Federal Center, Denver, CO 80225.

SHADED RELIEF MAP OF THE MARE BOREUM REGION OF MARS
MC-1: SECOND EDITION
M 5M 90/0 2RN
1988