

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NOTES ON BASE
This is one map in a series of topographic map sheets covering the entire surface of Mars at nominal scales of 1:5,000,000 and 1:25,000,000. First-edition sheets in this series were compiled largely with Mariner 9 data. Selected parts of the series are being revised on the basis of Viking data. The mapping is described by Batson (1973, 1976, and 1978). The Mariner 9 television experiment is described by Masursky and others (1970). A series of papers on the Viking missions is contained in the *Journal of Geophysical Research*, v. 82, no. 28 (September 30, 1977).

ADOPTED FIGURE
The figure of Mars used for the computation of the map projection is an oblate spheroid (flattening of 1/193) 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 mission passes through the crater Ary-2 (lat 5.19° S) within the crater Ary-1. In February 1978, the Mariner 9 control net was upgraded through the use of Viking data (Davies and others, 1978). Random discrepancies as large as 11 km exist between the Mariner 9 net (on which this sheet is based) and the new Viking net.

MAPPING TECHNIQUE
A series of mosaics of Mercator 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 techniques described by Inge (1973) and Inge and Bridges (1976). Sizes, shapes, and positions of features were taken from the base mosaic. In the first edition of the map (U.S. Geological Survey, 1973), 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. Computer enhancement of Mariner 9 pictures is described by Levinthal and others, 1973, and Green and others, 1973. This rendition was revised through examination of Viking Orbiter pictures to produce the current version.

Shaded relief analysis and representation were made by Susan L. Davis. Shaded relief revisions were made by Patricia M. Bridges.

COLOR
No attempt was made on the map to precisely duplicate the color of the martian surface, although the color used may approximate it.

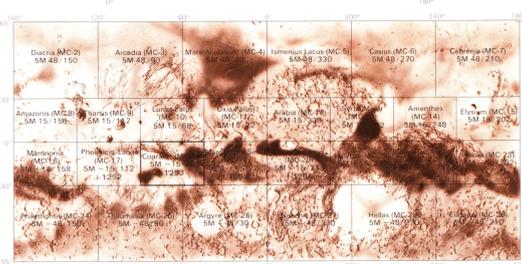
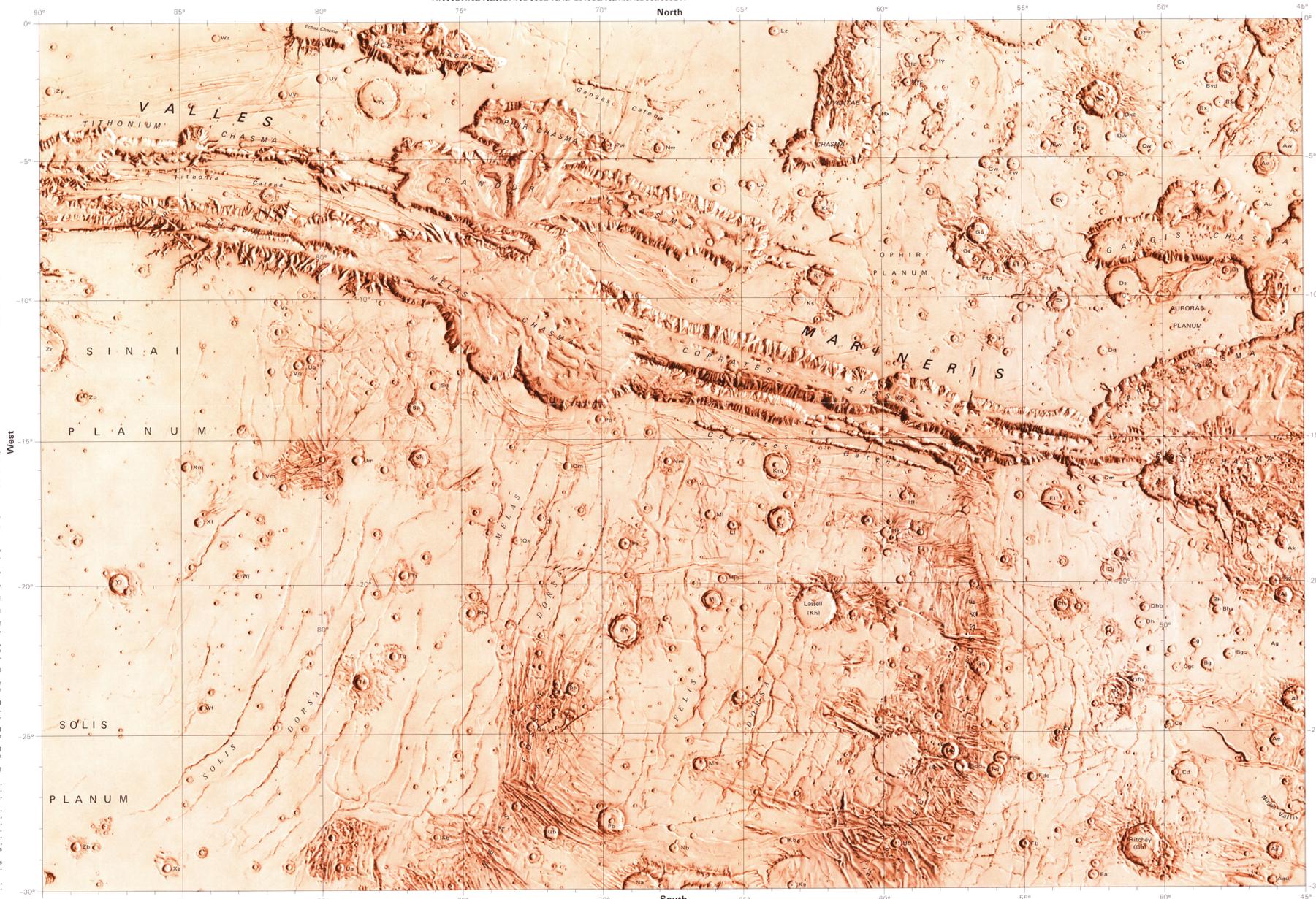
NOMENCLATURE
Names on this sheet are approved by the International Astronomical Union (IAU, 1974, 1976, and 1980) except for provisional names, which are listed below. Double and triple letter designations for craters refer to position on the map and are derived from a grid whose equidistant meridians 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 complete name of the quadrangle followed by a double or triple letter. The prefix COP (identifying the Coprates 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: Melas Fossae and Noctua Fossae.

MC-18: Abbreviation for Mars Chart 18.
M 5M-15/68 RN: Abbreviation for Mars 1:5,000,000 series; center of sheet, 15° S lat, 68° W long; shaded relief map, R, nomenclature N.

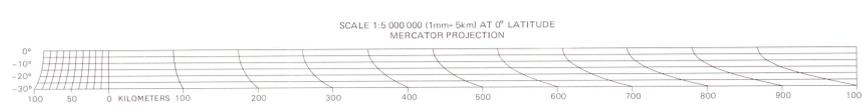
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QUADRANGLE LOCATION
Number preceded by 1 refers to published topographic map

Users noting errors or omissions are urged to indicate them on the map and forward it to U.S. Geological Survey, Building 4, Room 64, 2255 North Gemini Drive, Flagstaff, Arizona 86001. A replacement copy will be returned.



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.

Index No.	DAS No.	Index No.	DAS No.
1	7226883	26	8873699
2	7226953	27	8873713
3	7226923	28	8873723
4	7226929	29	8873753
5	8729099	30	7470503
6	7221183	31	7470513
7	8801559	32	7470543
8	8801489	33	7470713
9	8801419	34	7471053
10	8801349	35	8139733
11	5992529	36	8845259
12	5992523	37	8845239
13	7398473	38	8845139
14	7398443	39	8845129
15	7398613	40	8845059
16	7398613	41	8845059
17	7398663	42	6139173
18	7398753	43	6139173
19	7398103	44	6139243
20	8873519	45	7542993
21	8873449	46	7542963
22	8873379	47	7542933
23	1201029	48	7542903
24	8873309	49	7542953
25	8873239	50	8917289



INDEX TO VIKING SOURCE
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 601-6, Goddard Space Science Data Center, Greenbelt, MD 20771.

SHADED RELIEF MAP OF THE COPRATES QUADRANGLE OF MARS
MC-18
M 5M-15/68 RN
1980



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Revised in September 1979 on behalf of the Planetary Geology Program, Planetary Division, Office of Space Science, National Aeronautics and Space Administration under contract W-13709.

Viking 1		Viking 2	
Index No.	Picture No.	Index No.	Picture No.
1	65602	34	279801
2	65604	35	279802
3	65610	36	279803
4	12423	37	279804
5	12413		
6	68248		
7	68247		
8	68246		
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