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 from 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 1/192) 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. 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.
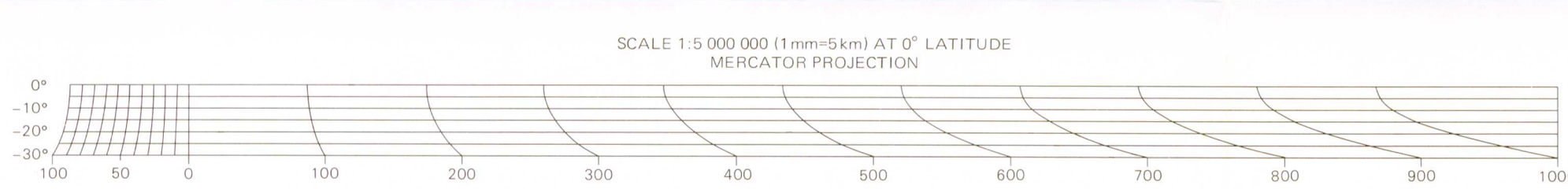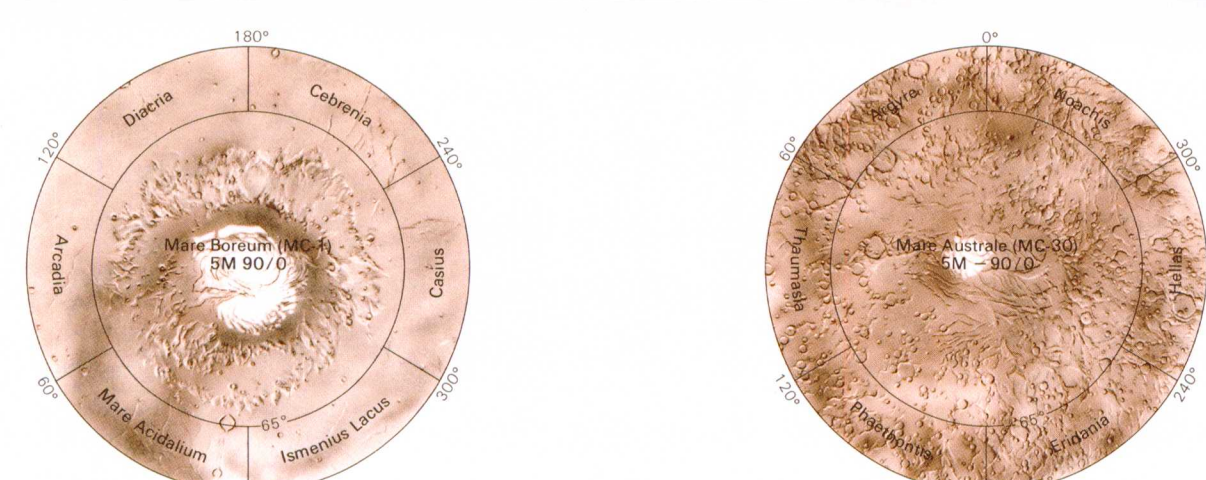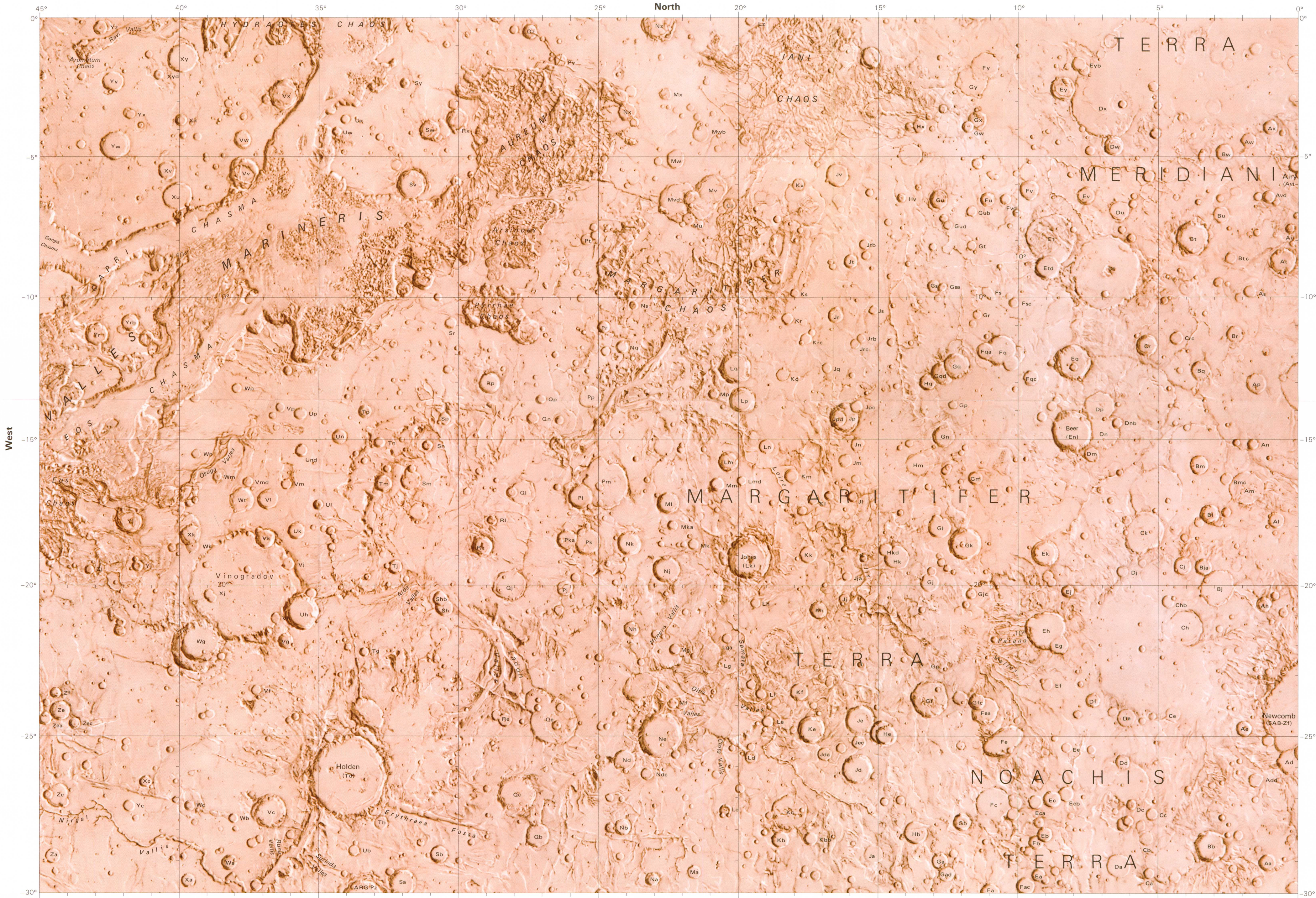
Shaded relief was portrayed with uniform illumination with the sun to the west, using airbrush techniques described by Inge (1972) and Inge and Bridges (1976). Sizes, shapes, and positions of features were taken from the base mosaic. In the first edition of the map (U.S. Geological Survey, 1975), various 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, 1975). This rendition was revised through examination of Viking Orbiter pictures to produce the current version.

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

COLOR

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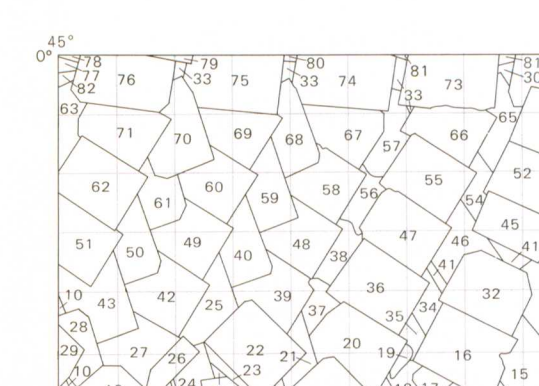
NOMENCLATURE

Names on this sheet are approved by the International Astronomical Union (IAU, 1974, 1977, 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 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 MAR (identifying the Margaritifer Sinus 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: Eos Chaos, Arsinoes Chaos, Pyrrhae Chaos, Loire Vallis

MC-19: Abbreviation for Mars Chart 19.
M 5M −15/22 RN: Abbreviation of Mars 1:5,000,000 series; center of sheet, 15° S lat, 22° long; shaded relief map, R, nomenclature N.
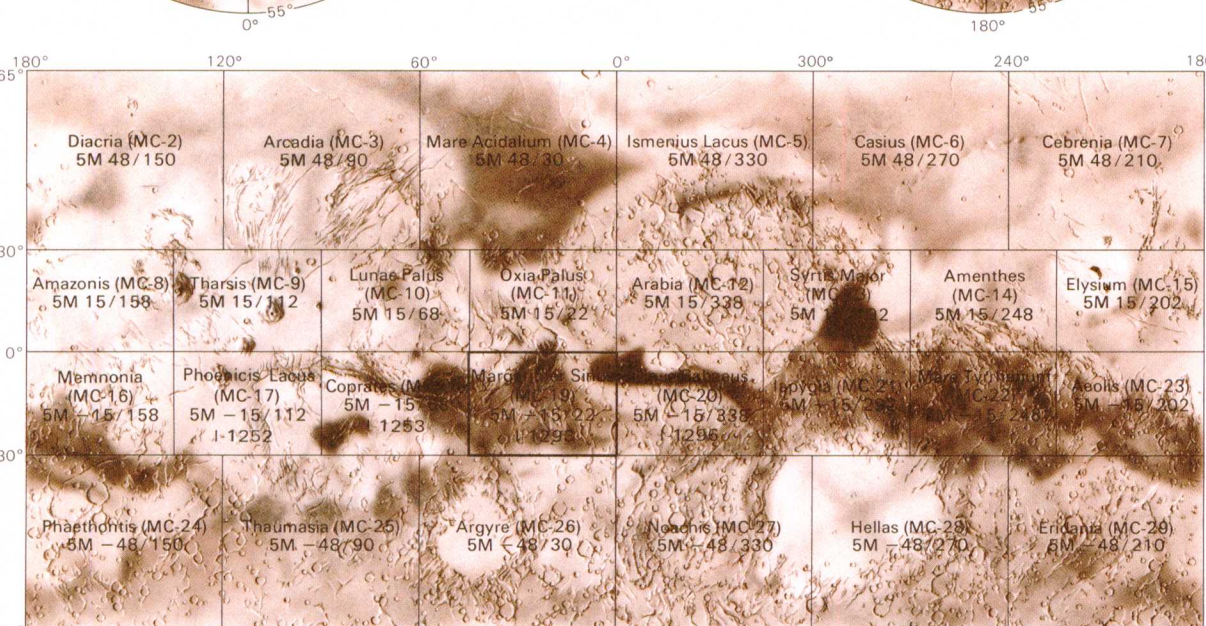
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SCALE 1:5 000 000 (1mm=5km) AT 0° LATITUDE
MERCATOR PROJECTION

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

INDEX TO VIKING ORBITER PICTURES
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 601.4, Goddard Space Science Data Center, Greenbelt, MD 20771.

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. The DAS number may differ slightly (usually by 5) among various versions of the same picture.

Interior - Geological Survey, Reston, Va.—1980—G80396

Revised in February 1980 on behalf of the Planetary Geology Program, Planetary Division, Office of Space Science, National Aeronautics and Space Administration under contract W-13,709.

SHADED RELIEF MAP OF THE MARGARITIFER SINUS QUADRANGLE OF MARS

MC-19
M 5M −15/22 RN
1980