

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

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 Maurusky 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 1:4,338,000 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 Ainy-O (lat 5.19° S) within the crater Ainy. 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 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.

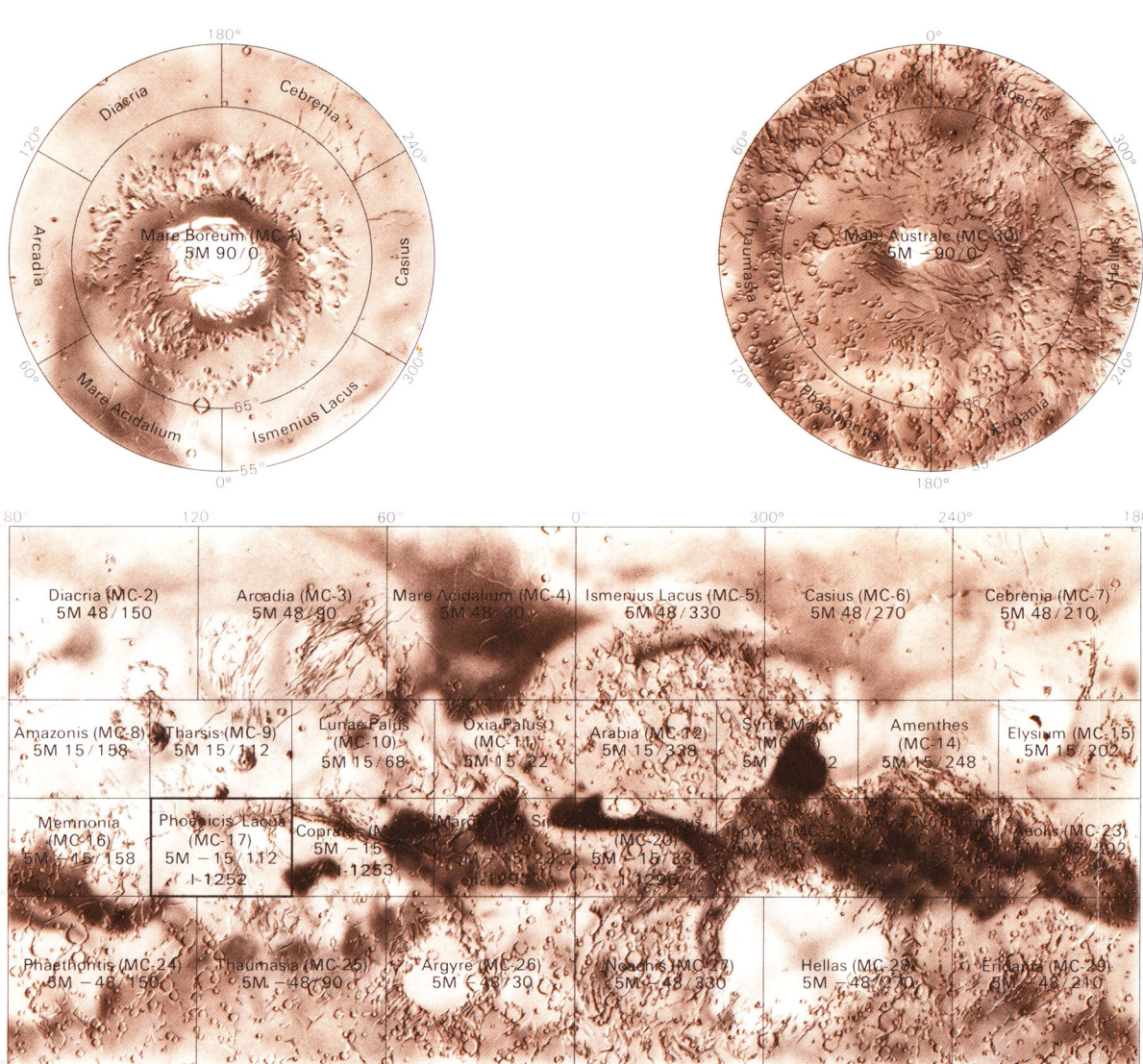
NOMENCLATURE

All names on this sheet are approved by the International Astronomical Union (IAU, 1974, 1977). Double- and triple-letter designations for craters for position on the map and are derived from a grid based on equidistant meridians and parallels; the alphabets (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 PH (identifying the Phoenicis Lacus 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.

MC-17: Abbreviation for Mars Chart 17.
M 5M -15/112 RN: Abbreviation for Mars 1:5,000,000 series; center of sheet, 15° S lat, 112° long; shaded relief map, R, nomenclature N.

REFERENCES

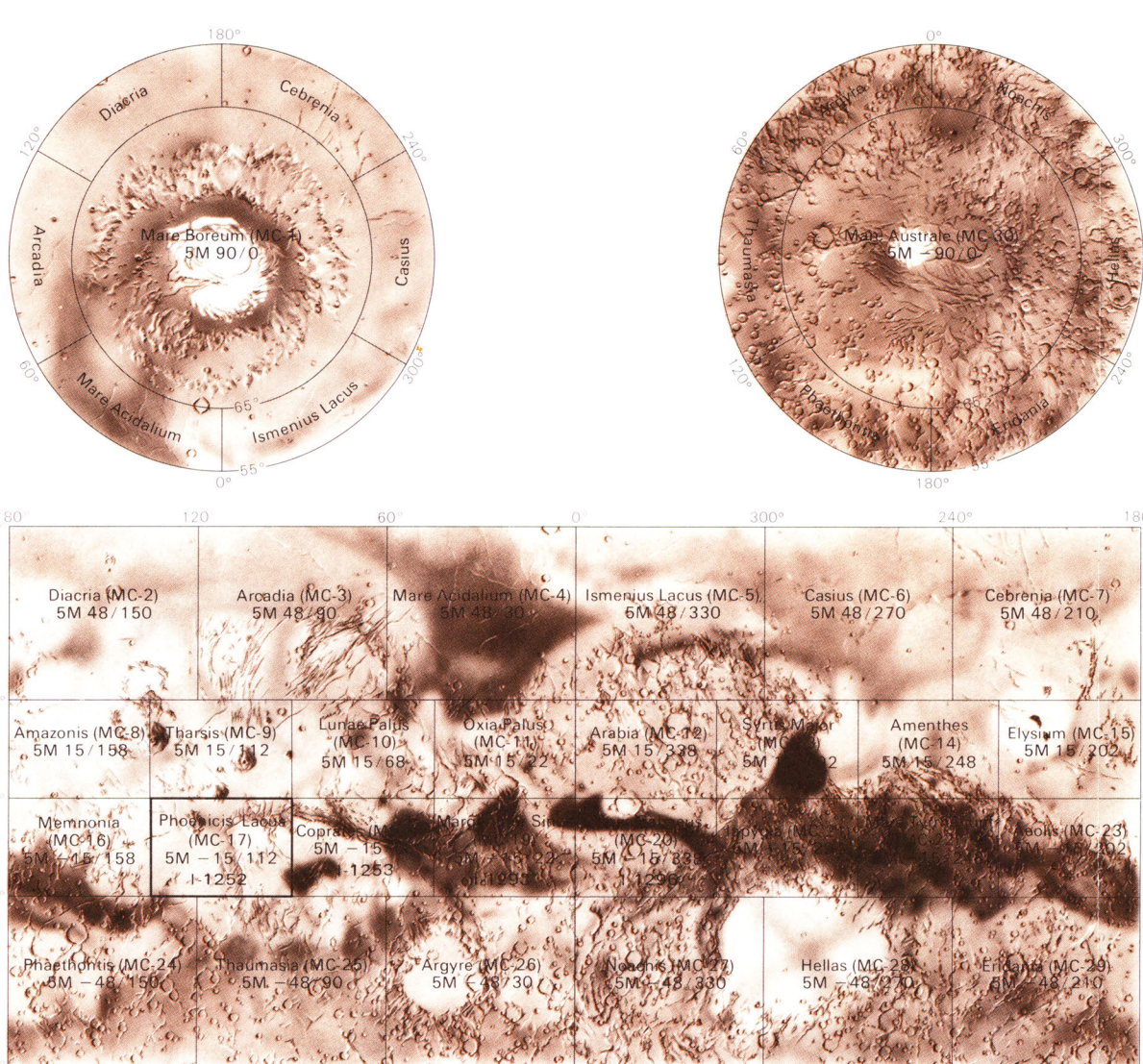
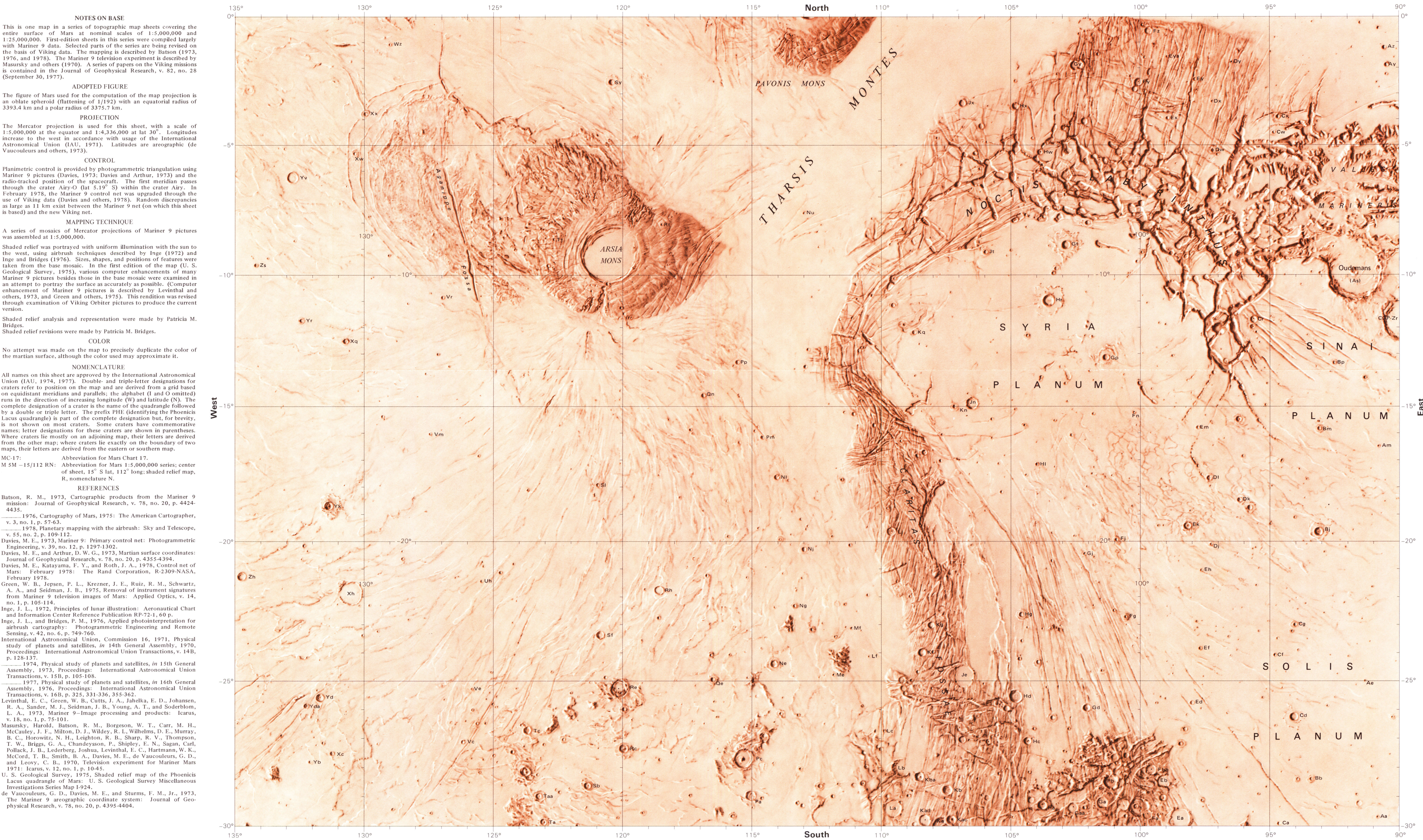
Batson, R. M., 1973, Cartographic products from the Mariner 9 mission: Journal of Geophysical Research, v. 78, no. 20, p. 4424-4435.
1976, Cartography of Mars, 1975: The American Cartographer, v. 3, no. 1, p. 57-63.
1978, Planetary mapping with the airbrush: Sky and Telescope, v. 55, no. 2, p. 109-112.
Davies, M. E., 1973, Mariner 9: Primary control net: Photogrammetric Engineering, v. 39, no. 12, p. 1297-1302.
Davies, M. E., and Arthur, D. W. G., 1973, Martian surface coordinates: Journal of Geophysical Research, v. 78, no. 20, p. 4355-4394.
Davies, M. E., Katayama, F. Y., and Roth, J. A., 1975, Control net of Mars: February 1978: The Rand Corporation, R-2309-NASA, February 1978.
Green, W. B., Jensen, P. L., Kremer, J. E., Ruiz, R. M., Schwartz, A. A., and Seidman, J. B., 1975, Removal of instrument signatures from Mariner 9 television images of Mars: Applied Optics, v. 14, no. 1, p. 105-114.
Inge, J. L., 1972, Principles of lunar illustration: Aeronautical Chart and Information Center Reference Publication RP-72-1, 60 p.
Inge, J. L., and Bridges, P. M., 1976, Applied photointerpretation for airbrush cartography: Photogrammetric Engineering and Remote Sensing, v. 42, no. 6, p. 749-760.
International Astronomical Union, Commission 16, 1971, Physical study of planets and satellites, in 14th General Assembly, 1970, Proceedings: International Astronomical Union Transactions, v. 14B, p. 128-137.
1974, Physical study of planets and satellites, in 15th General Assembly, 1973, Proceedings: International Astronomical Union Transactions, v. 15B, p. 185-188.
1977, Physical study of planets and satellites, in 16th General Assembly, 1976, Proceedings: International Astronomical Union Transactions, v. 16B, p. 325-331, 336-352-362.
Levinthal, E. C., Green, W. B., Curtis, J. A., Jabluka, E. D., Johansen, R. A., Sander, M. J., Seidman, J. B., Young, A. T., and Soderblom, L. A., 1973, Mariner 9—Image processing and products: Icarus, v. 18, no. 1, p. 75-101.
Maurusky, Harold, Batson, R. M., Borgeson, W. T., Carr, M. H., McCauley, J. F., Milton, D. J., Willey, R. L., Wilhelm, D. E., Murray, B. C., Borowitz, N. H., Leighton, R. B., Sharp, R. V., Thompson, T. W., Briggs, G. A., Chandrasekhar, P., Shipley, E. N., Sagan, Carl, Pollack, J. B., Lederberg, Joshua, Levinthal, E. C., Hartmann, W. R., McCord, T. B., Smith, B. A., Davies, M. E., de Vaucouleurs, G. D., and Leovy, C. B., 1970, Television experiment for Mariner Mars 1971: Icarus, v. 12, no. 1, p. 10-45.
U. S. Geological Survey, 1975, Shaded relief map of the Phoenicis Lacus quadrangle of Mars: U. S. Geological Survey Miscellaneous Investigations Series Map I-224.
de Vaucouleurs, G. D., Davies, M. E., and Sturms, F. M., Jr., 1973, The Mariner 9 areographic coordinate system: Journal of Geophysical Research, v. 78, no. 20, p. 4395-4404.



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.

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

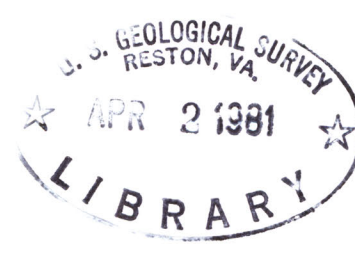


QUADRANGLE LOCATION
Number preceded by 1 refers to published topographic map

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.

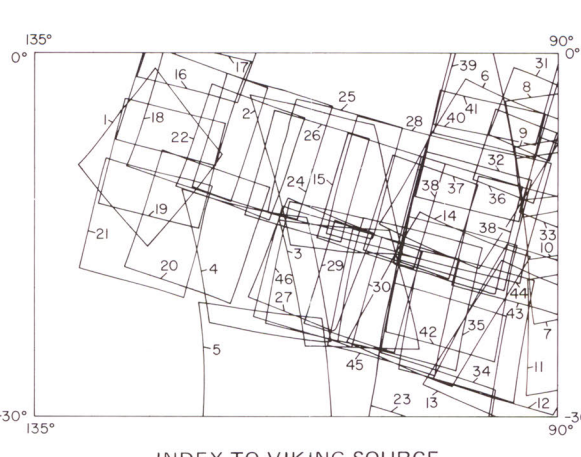
SHADED RELIEF MAP OF THE PHOENICIS LACUS QUADRANGLE OF MARS

MC-17
M 5M -15/112 RN
1980



Interior—Geological Survey, Reston, Va.—1980—G80905
Revised in November 1979 on behalf of the Planetary
Geology Program, Planetary Division, Office of Space Science,
National Aeronautics and Space Administration under con-
tract W-13,709.

| Viking 1 | | | | Viking 2 | | | |
|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|
| Index No. | Picture No. | Index No. | Picture No. | Index No. | Picture No. | Index No. | Picture No. |
| 1 | 416A03 | 15 | 344880 | 31 | 344804 | | |
| 2 | 284A09 | 16 | 306832 | 32 | 307818 | | |
| 3 | 284A08 | 17 | 306834 | 33 | 344802 | | |
| 4 | 284A09 | 18 | 344888 | 34 | 307824 | | |
| 5 | 284A09 | 19 | 306836 | 35 | 344806 | | |
| 6 | 416A01 | 20 | 344889 | 36 | 344807 | | |
| 7 | 444A18 | 21 | 306838 | 37 | 344802 | | |
| 8 | 444A14 | 22 | 344816 | 38 | 344802 | | |
| 9 | 444A12 | 23 | 307822 | 39 | 307814 | | |
| 10 | 444A14 | 24 | 344890 | 40 | 307811 | | |
| 11 | 444A20 | 25 | 344892 | 41 | 307816 | | |
| 12 | 416A04 | 26 | 344818 | 42 | 307820 | | |
| 13 | 416A00 | 27 | 344869 | 43 | 344864 | | |
| 14 | 416A02 | 28 | 344894 | 44 | 344896 | | |
| | | 29 | 344871 | 45 | 344881 | | |
| | | 30 | 344879 | 46 | 344893 | | |



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 6014,
Goddard Space Science Data Center, Greenbelt, MD
20771.

For sale by Branch of Distribution, U.S. Geological Survey,
1200 South East Street, Arlington, VA 22202 and Branch of Distribution,
U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225

M(200)
1-1252
C2

