DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF MARS
1:5,000,000 GEOLOGIC SERIES
MARE ACIDALIUM QUADRANGLE
M SM 4K30 G, 1984
I-1614 (MC-4)

GEOLOGIC MAP OF MARE ACIDALIUM QUADRANGLE, MARS (REVISED)

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NOTES ON BASE

A series of 104 photographic mosaics covering the entire surface of Mars at a nominal scale of 1:5,000,000, was originally compiled from Mariner 9 data. Details of the Mariner 9 mission that are related to the mapping are described by Batson and others (1979). The final mosaics were published as 1:15,000,000 images. 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 equatorial radius of 3393.4 km and a polar radius of 3375.7 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 latitudes ±30.3° and 1:2,500,000 at latitudes ±59.5°. Standard parallels for the Lambert conformal conic projection are at latitudes ±33.8° and ±59.2°. Longitudes increase to the west in accordance with astronomical convention for Mars.

CONTROL

Planimetric control is provided by photogrammetric methods described by Davies and Arthur (1973) and Davies and Arthur (1975) and the radiotracked position of the Mariner 9 spacecraft. The first meridian passes through the center of a small crater, Airy-0 (lat 5.19° S., long 0°), located 6 km east of crater Airy.

MAPPING TECHNIQUE

A series of mosaics of Mariner 9 pictures was assembled at 1:5,000,000 scale using a photographic technique.

Shaded-relief images were produced using airbrush techniques detailed by Inge (1972) and photointerpretive methods described by Inge and Bridges (1976). Uniform sun illumination from the west was used throughout. Figure 1 shows the coverage and index numbers of the frames in the base mosaic. In the first edition of the map, 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. The enhancements were made to display interpreting information derived from various enhancements of higher resolution Viking images of the map area.

Original shaded relief analysis and representation were made by Jay L. Inge.

Revisions were made by Barbara J. Huff.

NONCLASSIFICATI

Names on this sheet are approved by the International Astronomical Union (IAU; 1974, 1975, 1980, and 1982).

MC-4 Abbreviation for Mars Chart 4

M SM 4h30 G Abbreviation for Mars, 1:5,000,000 series, center of sheet, lat 44°, long 30° ; geologic map, G.

REFERENCES

American Geophysical Union, 1977, Journal of Geophysical Research, v. 82, no. 28, p. 4219-4224.

Batson, 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, NASA SP-439, 103 p.

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.

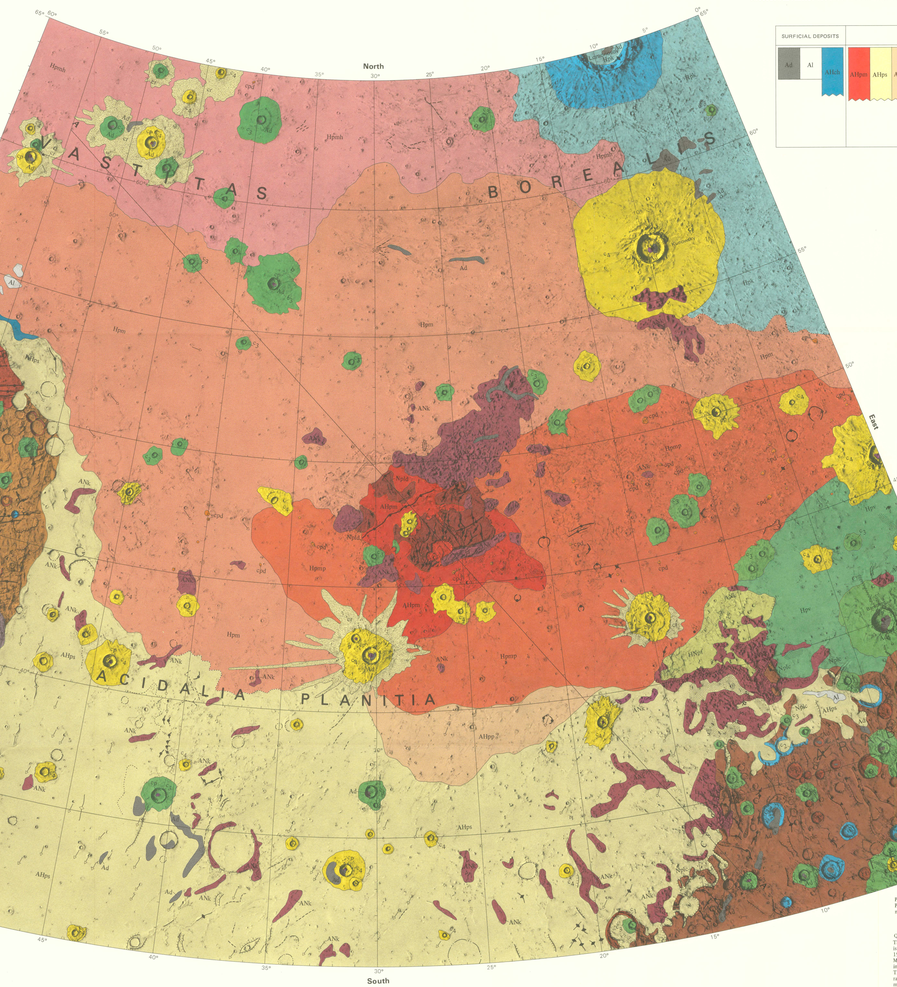
Inge, J. L., 1973, Principles of lunar illustration: Astronautical Chart and Information Center Reference Publication 73-1, 30 p.

Inge, J. L., and Bridges, P. M., 1976, Applied photointerpretation for airbrush cartography: Photogrammetric Engineering and Remote Sensing, v. 42, no. 12, p. 1547-1554.

International Astronomical Union, 1954, Commission 16: Physical study of planets and satellites, and Lunar and martian nomenclature, in 10th General Assembly, Rome, 1952, Proceedings: International Astronomical Union Transactions, v. 14B, p. 321-323, 331-336, 355-362.

———1961, Working Group for Planetary System Nomenclature, in 11th General Assembly, Montreal, 1958, Proceedings: International Astronomical Union Transactions, v. 11B, p. 293-297.

———1973, Working Group for Planetary System Nomenclature, in 14th General Assembly, Paris, 1982, Proceedings: International Astronomical Union Transactions, v. 18B, p. 324-336.


North
South
SCALE 1:4,336,000 (1 mm=4.336 km) AT 30° LATITUDE
LAMBERT CONFORMAL PROJECTION
0 KILOMETERS
BOREALIA
PLANITIA
CIMMERIA
TERRA
ARABIA
TERRA
SYRTIS
MAJOR
Mare Acidalium
Chryse
Acidalia
Planitia
Tharsis
Valles
Marineris
Elysium
Amazonis
Planitia
Olympus
Mons
Arsia
Mons
Pavonis
Mons
Ascraeus
Mons
Alba
Patera
Hellas
Basin
Utopia
Basin
Isidis
Basin
Solis
Lacus
Sinus
Sabaeus
Meridiani
Sinus
Margaritifer
Sinus
Aurorae
Sinus
Deucalionis
Region
Noachis
Terra
Hesperia
Planum
Lunae
Planum
Tempe
Terra
Daedalia
Planum
Ismenius
Lacus
Amenthes
Cavi
Elysium
Mons
Hecates
Tholus
Cerberus
Fossae
Memnonia
Sirenum
Fossae
Phlegra
Montes
Cydonia
Mensae
Deuteronilus
Mensae
Protonilus
Mensae
Nilosyrtis
Mensae
Olympica
Fossae
Alba
Mons
Tempe
Fossae
Ismenius
Lacus
Fossae
Memnonia
Fossae
Sirenum
Fossae
Phlegra
Montes
Cydonia
Labyrinthus
Amazonis
Planitia
Elysium
Planitia
Utopia
Planitia
Isidis
Planitia
Solis
Planum
Syrtis
Major
Planum
Hesperia
Planum
Lunae
Planum
Tempe
Terra
Daedalia
Planum
Ismenius
Lacus
Amenthes
Cavi
Elysium
Mons
Hecates
Tholus
Cerberus
Fossae
Memnonia