U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF VENUS
1:10,000,000 SERIES
V 10M 30/240 CMRN, 1998
I–2457 SHEET 2 OF 4

RADAR IMAGE AND SHADED RELIEF MAP OF THE GUINEVERE PLANITIA REGION OF VENUS

V 10M 30/240 CMRN

1998

Prepared on behalf of the NASA Planetary Geology and Geophysics program and the Magellan Project Office of the Jet Propulsion Laboratory
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SCALE 1:16 354 349 (1 mm = 16.35 km) AT 0° LATITUDE
1:10 000 000 AT 52.305° LATITUDE
MERCATOR PROJECTION

1000 800 600 400 200 0 KILOMETERS 200 400 600 800 1000

NOTES ON BASE

This sheet is one in a series of maps of Venus at nominal scales of 1:50,000,000 and 1:10,000,000 (Planetary Cartography Working Group, 1984, 1993; Batson and others, 1994). It is based on data from the Magellan Synthetic Aperture Radar (SAR) and radar altimetry instruments. The Magellan Mission was described by Saunders and Pettengill (1991). Magellan radar characteristics were described by Pettengill and others (1991).

ADOPTED FIGURE

The figure of Venus used for the computation of the map projection is a sphere with a mean radius of 6,051.0 km, consistent with the preliminary gravity figure reported by Phillips and others (1979) that was used for previous maps of Venus. Slightly larger values of the mean radius of Venus have subsequently been reported based on Pioneer Venus (Pettengill and others, 1980) and Magellan altimetry (Ford and Pettengill, 1992).

PROJECTION

The Mercator projection is used for this sheet. The scale is 1:16,354,349 at 0° latitude; it is 1:9,145,190 at ±56.0° latitude, as is the scale at this latitude in the polar stereographic projection. Due to the retrograde rotation of Venus, longitude increases from west to east in accordance with usage of the International Astronomical Union (1971).

CONTROL

Planimetric control is derived from the radio-tracked position of the spacecraft. The first meridian passes through the central peak of the crater Ariadne, at lat 43.8° N., according to current International Astronomical Union convention. (Ariadne replaces the feature "Eve," which, at the same longitude, originally fixed the location of the prime meridian [Davies and others, 1986].) The venusian cartographic coordinate system was described by Davies and others (1992).

MAPPING TECHNIQUES

This map image base is compiled from the synthetic aperture radar (SAR) image mosaic (sheet 1) overlayed upon the relief image used as a relief base in sheet 4. Magellan SAR datasets were originally produced by the Jet Propulsion Laboratory. Full-resolution (75 m/pixel) image strips were compressed and mosaicked to produce C1-MIDR's (Compressed-Once Mosaicked Image Data Records; 225 m/pixel) (Pettengill and others, 1991). C1-MIDR's were assembled and reprojected. Cycles 1 and 2 left (east)-looking and Cycle 2 right (west)-looking data records were used in the (SAR) image mosaic. (Cycle 1 radar operations commenced September 15, 1990, and ended May 1, 1991; Cycle 2 began May 16, 1991, and ended January 17, 1992; Cycle 3 began January 17, 1992, and ended September 13, 1992).
The underlying relief image was compiled by interpretation and digital manipulation of computer-generated relief images from the Magellan altimetry data. Topographic information obtained from Magellan radar altimeter measurements was rendered as a shaded relief image by converting the slope segments between elevation values to reflectance values, using methods described by Edwards (1987). All landforms were shown as if illuminated from the west. Data for shaded relief were derived from computer processing of radar altimetric information provided by the Massachusetts Institute of Technology (Pettengill and others, 1991). Interpretive image-processing was then used to remove artifacts and to enhance the digital-image details, by use of portrayal and photo-interpretive methods described by Inge and Bridges (1976). Synthetic aperture radar (SAR) imagery was used to confirm geographic features and control as well as to aid in adding distinctive surface features revealed by the sharper resolution of the SAR images. Gaps in coverage by the Magellan radar altimeter were filled by lower resolution image data from the Pioneer Venus Mission, precluding uniform portrayal of detail.

SAR mosaic processing was done by Robert M. Sucharski; creation of the shaded relief base and image compilation were done by Ralph Aeschliman.

NOMENCLATURE

Names on this sheet are approved by the International Astronomical Union (1980, 1983, 1986, 1992, 1996, 1998).

V 10M 30/240 CMRN: Abbreviation for Venus; 1:10,000,000 series; center of map, lat 30° N., long 240°; controlled mosaic (CM) with shaded relief (R) and nomenclature (N).

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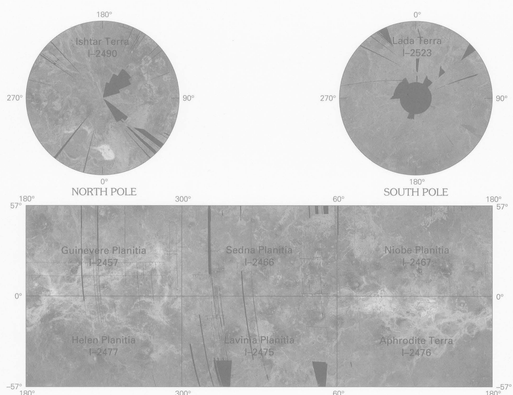

INDEX OF THE 1:10,000,000 SCALE MAP SERIES OF VENUS
Number preceded by "I" indicates published map.

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 451, 2255 N. Gemini Drive, Flagstaff, AZ 86001. A replacement copy will be returned.

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