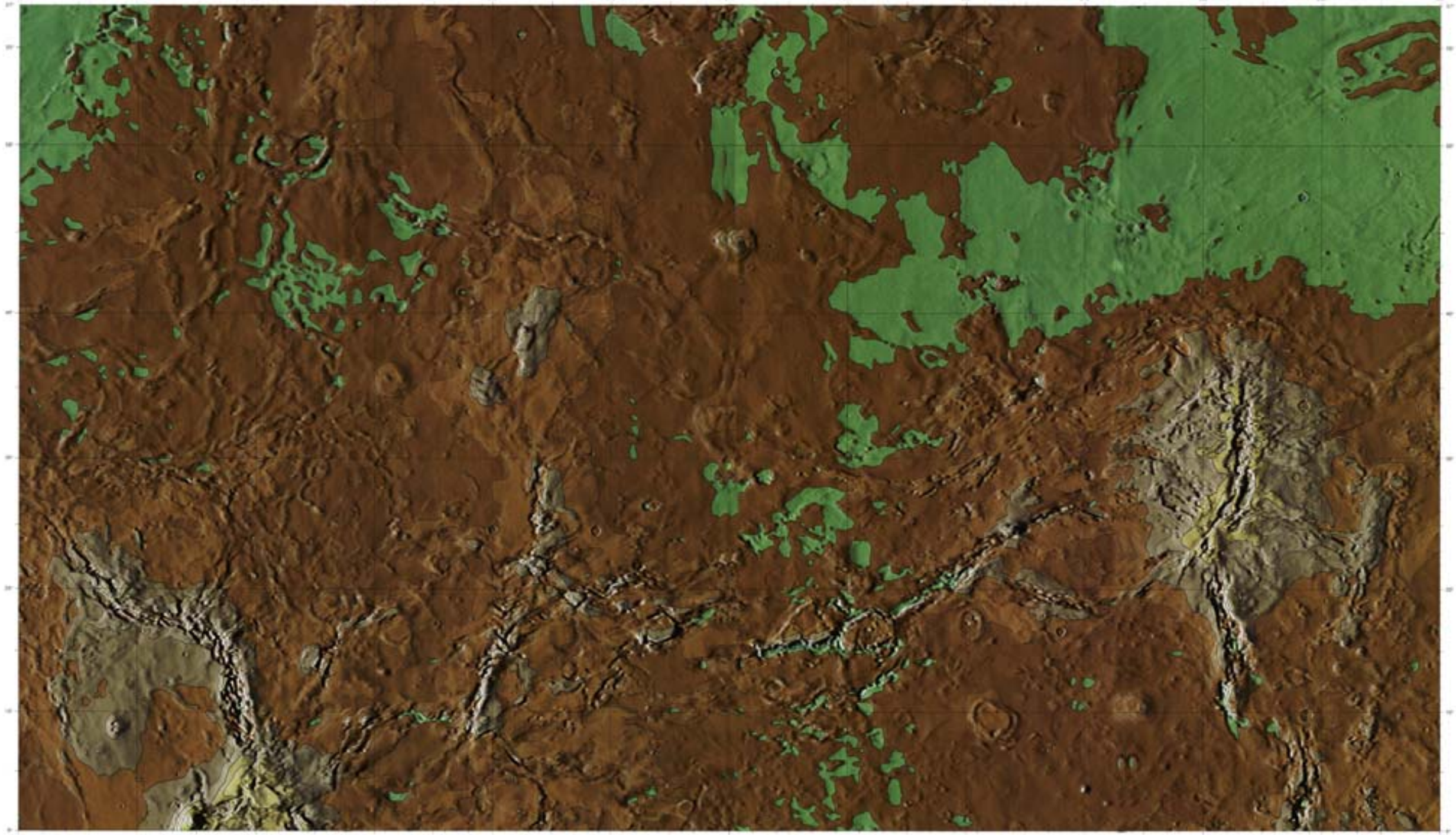
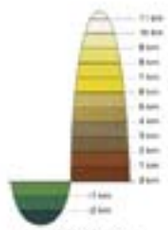
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

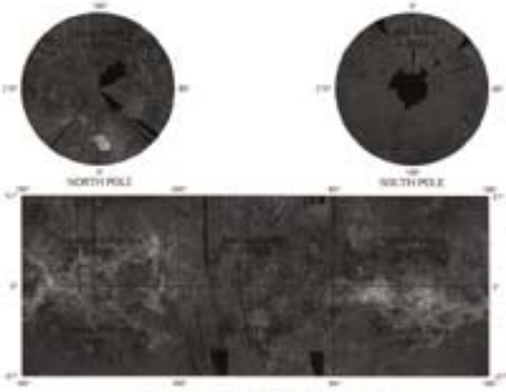
Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF VENUS
1:10,000,000 SERIES
V 10M 30/240 RTK, 1998
I-2417 SHEET 4 OF 4





ELEVATION CONTOURS
"0 km" equals a planetary radius of 6051.8 km



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

NOTES ON BASE

This sheet is one in a series of maps of Venus at nominal scales of 1:10,000,000 and 1:10,000,000 (Planetary Cartography Working Group, 1984, 1993; Batson, 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 extrapolation of the map projection is a sphere with a mean radius of 6,051.8 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, 1988) and Magellan altimetry (Ford and Pettengill, 1992).

PROJECTION

The Mercator projection is used for this sheet. The scale is 1:16,204,349 at 0° latitude; it is 1:9,145,190 at 156.9° latitude; as is the scale at this latitude in the polar stereographic projection. Due to the retrograde rotation of Venus, longitude increases from east to west in accordance with usage of the International Astronomical Union (1971).

CONTROL

Planetary 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 42.8° N., according to current International Astronomical Union convention. (Ariadne replaces the historic 'Eve,' which, at the same longitude, originally fixed the location of the prime meridian (Davies and others, 1986).) The cartesian cartographic coordinate system was described by Davies and others (1992).

CONTOURS

Because Venus has no surface water and hence no sea level, the topographic datum (the 0 km contour) is defined as a sphere with a radius of 6,051.8 km. Data for topographic contours were derived from computer processing of Magellan radar altimetric data (provided by the Massachusetts Institute of Technology (Pettengill and others, 1991)). These contours were then rectified and brought into accord with the relief image (see Mapping Techniques, below).

MAPPING TECHNIQUES

Topographic information extracted from Magellan radar altimeter measurements has been shown as shaded relief by converting the slope segments between elevation values to reflectance values, using methods described by Edwards (1987). All land forms are shown as if illuminated from the west. Data for shaded relief were derived from extensive processing of radar altimetric information provided by the Massachusetts Institute of Technology (Pettengill and others, 1991).

Interactive image processing was used to remove artifacts, to enhance the digital image details, and to add distinctive surface features taken from SAR images by use of photogrammetric and photointerpretive methods previously used in airbrush cartography described by Inge and Bridges (1976). Gaps in coverage by the Magellan radar altimeter were filled by lower resolution image data from the Pioneer Venus and Venera 15 and 16 missions, precluding uniform portrayal of detail. Contour were generated at one kilometer elevation intervals from the altimetry data and matched to the two relief images. From these modified contours, the color data was generated.

Colors were chosen to lead the viewer, as intuitively as possible, to elevation information; that is, the colors help the viewer automatically see low elevation as lower in tone than other elevations. Also, colors selected suggest a rocky, landscape rather than sweet or vegetation. A deliberate color contrast between a reddish-brown and a warm (brown) was chosen to demarcate the 0 km contour boundary (radius of 6,051.8 km). The color also was then merged with the relief image.

Shaded relief image interpretation and postmap, elevation contours and cartographic processing by Ralph Aeschliman.

NOMENCLATURE

V 10M 30/240 RTK. Abbreviation for Venus, 1:10,000,000 series, central at zero, lat 30° N., long 240°; shaded relief (R) with contours (T) and color shot (R).

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TOPOGRAPHIC MAP OF THE GUINEVERE PLANITIA REGION OF VENUS

V 10M 30/240 RTK

1998

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, Branch of Astrogeologic Studies, 2255 N. Gemini Drive, Flagstaff, AZ 86001. A replacement map will be furnished.

To order U.S. Geological Survey Information Services, Box 25286, Federal Center, Denver, CO 80225