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VENUS MAPPING

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New semicontrolled image mosaics of Venus, based on Magellan data, are being compiled at 1:50,000,000, 1:10,000,000, 1:5,000,000 and 1:1,000,000 scales to support the Magellan Radar Investigator (RADIG) team. The mosaics are semicontrolled in the sense that data gaps have not been filled and significant cosmetic inconsistencies exist. Contours are based on preliminary radar altimetry data that is subject to revision and improvement. Final maps to support geologic mapping and other scientific investigations, to be compiled as the dataset becomes complete, will be sponsored by the Planetary Geology and Geophysics Program and/or the Venus Data Analysis Program. All maps, both semicontrolled and final, will be published as I-maps by the USGS. All of the mapping is based on existing knowledge of the spacecraft orbit; photogrammetric triangulation, a traditional basis for geodetic control on planets where framing cameras were used, is not feasible with the radar images of Venus, although an eventual shift of the coordinate system to a revised spin-axis location is anticipated. This is expected to be small enough that it will affect only large-scale maps.

Table 1 shows the Venus mapping plan. The first set of maps is being compiled on eight sheets (figure 1). They are radar image mosaics and will show preliminary nomenclature and topography. This eight-quadrangle format (8QF) was scaled at the pole to 1:10,000,000; the Mercator projections that join the Polar Stereographic projections are scaled to join at 56° lat (north and south), resulting in a scale of 1:10,000,000 at 52.305° N and S lat and 1:16,354,353 at the equator. Airbrushing on the 8QF sheets and on the 1:50,000,000-scale planetwide map (figure 2) will be done at the same time as the semicontrolled mapping. The airbrush maps will restore an impression of topographic relief that is lost in the radar image mosaics. Base maps for systematic geologic mapping will be made at 1:5,000,000 scale (figure 3); airbrushing will probably not be done at this scale. A 1:1,000,000-scale series of special high-resolution mosaics is being made of areas of high scientific interest. Preliminary versions are being compiled for the Magellan team, and it is anticipated that mapping at this scale will continue for many years, as has been the case with the Mars 1:500,000-scale geologic mapping program.

Table 1. Venus mapping plan.

SCALE	NUMBER OF SHEETS	DESCRIPTION	EXPECTED PUBL DATE
1:50M	1	Airbrush (preliminary), provisional nomenclature, contours from radar altimetry. Prepared under MGN project funding.	1992
1:50M	1	Airbrush map of Venus (final), IAU-approved nomenclature, contours from final altimetry version. Prepared under PGG funding.	1994
1:10M	8	Image mosaics (preliminary, nominal mission data only; gaps and tonal discrepancies will be present), provisional nomenclature, contours from radar altimetry. Prepared under MGN project funding.	1991, 1992
1:10M	8	Airbrush shaded relief and radar brightness markings, nomenclature (some may be provisional) contours from radar altimetry. Prepared under PGG funding.	1991 - 1993
1:5M	62	Image mosaics, with gaps filled with data from mapping cycles beyond those of the nominal mission; cosmetics and tone balancing appropriate to formal map series; contours primarily from radar altimetry, modified as feasible by other techniques; IAU approved nomenclature. Prepared under PGG funding.	1992 - 1995
1:1M	TBD	Areas selected on the basis of scientific interest; initial quads will be semicontrolled-- they may contain gaps, tonal inconsistencies, provisional nomenclature and contours derived from preliminary data. As the program continues, experimental and innovative cartographic image-processing methods will be	1991 - 2001

used, and final maps will display information appropriate to a formal map series. Initial quads prepared under MGN project; later quads under PGG funding.

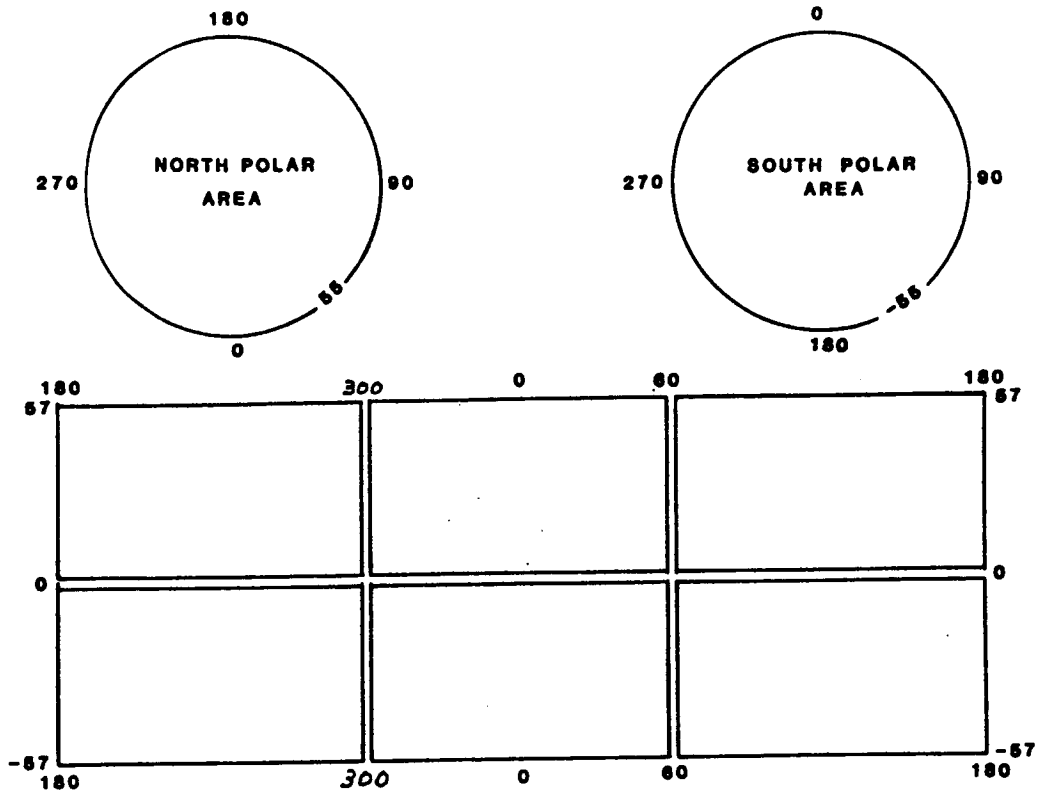


Figure 1. 1:10,000,000 mapping format

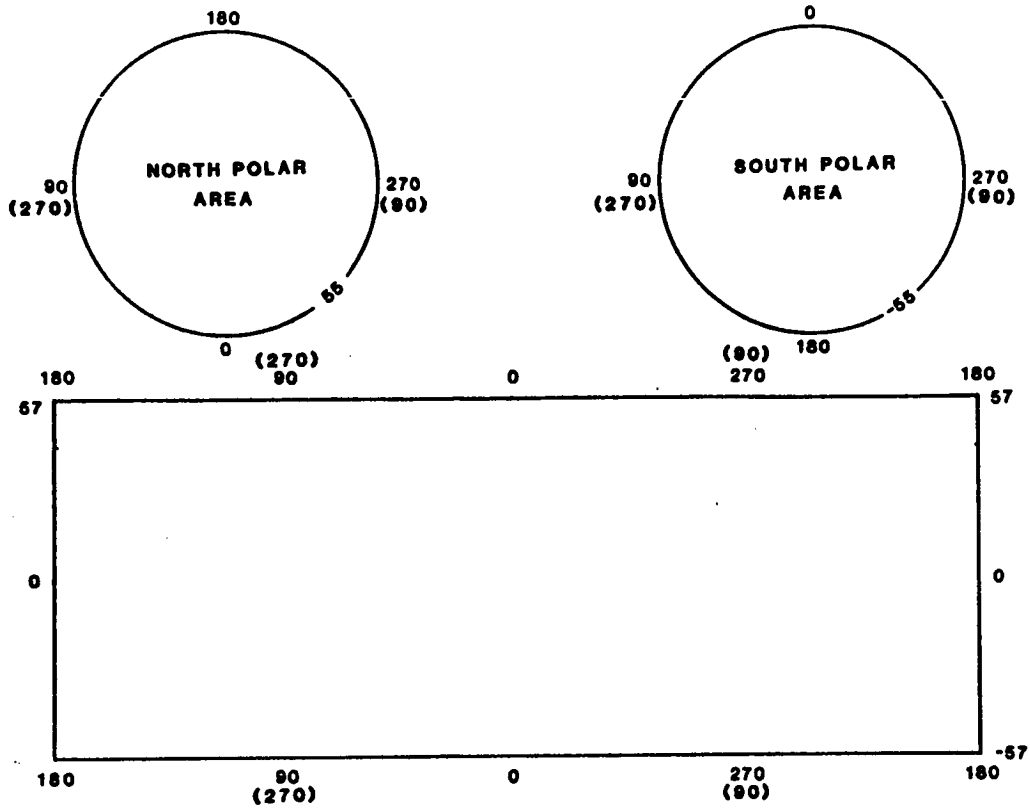


Figure 2. 1:50,000,000 planetwide format

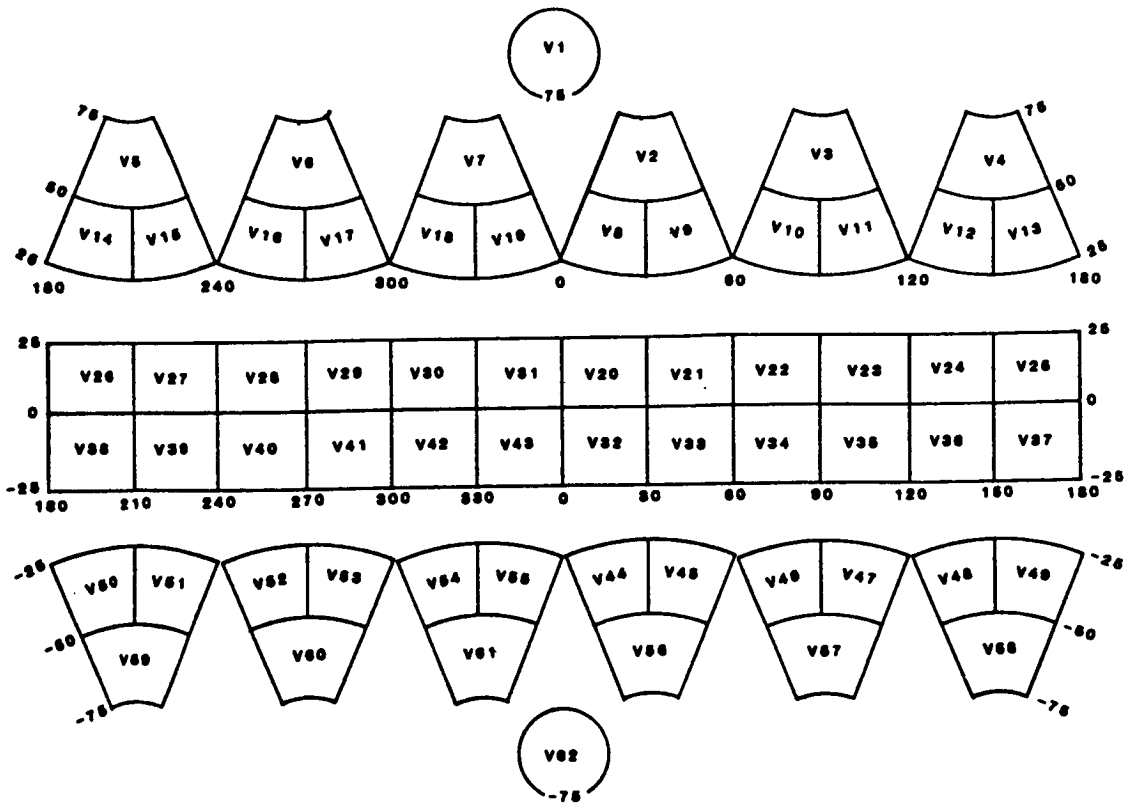


Figure 3. 1:5,000,000 mapping format