

MARS CARTOGRAPHIC COVERAGE: STATUS PRIOR TO MARS-94 MISSION  
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Mars surface area (144 mln.sq.km), being slightly less than that of the Earth's continents (149 mln. sq. km), have sufficiently regular cartographic coverage at 1:2,000,000 scale. All maps of Mars surface relief and topography were obtained during the recent 20 years with the space images. Most of these maps were produced by the US Geological Survey, Flagstaff, AZ.

GENERAL IMAGE MAPS. To obtain an overview impression of the current status of Martian mapping on the eve of MARS-94 mission one should know that the whole planet is covered with 1:2,000,000-scale image map (= photomap or controlled photomosaics). It consists of 144 sheets covering about 1,000,000 sq. km each. There are the areas on the map with the resolution insufficient for such scale map.

The smaller-scale maps also exist for global coverage - 1:5,000,000 (30 sheets), 1:15,000,000 (3 sheets), and 1:25,000,000 (1 sheet) [4].

Maps in scales large than 1:2,000,000 exist only for restricted areas of the planet (Fig. 1). Most of 1:1,000,000-scale maps are based on the enlarged early Mariner 9 images and are of not up-to-date quality, as they have coarser resolution in comparison with Viking-based 1:2,000,000 maps.

The image maps (controlled photomosaics) of 1:500,000 scale exist for large areas of Mars. There are 169 sheets for the different areas, published up to now. They cover 8.6% of Mars (12.4 mln. sq. km). There are also 3 revised edition sheets, and 5 areas near North pole have sets of two sheets presenting different season appearance of the surface. Each of sheets covers the area of 73,000 sq.km, which is equal to the area of New Hampshire, Vermont, Massachusetts, and Rhode Island taken together. Global coverage of Mars with 1:500,000-scale map needs 1964 sheets, but it is not planned to produce all of them. These maps are based on high-resolution Viking pictures, but the resolution differs between the sheets, and even sometimes within the same sheet.

Mosaics at 1:250,000 scale exist for 4 very small areas connected with Viking landing sites (both final and potential).

GEOLOGIC MAPS cover whole Mars at 1:5,000,000 (30 sheets) and smaller scales. There is a set of 16 sheets of lava flow maps at 1:2,000,000 scale for Tharsis Montes and vicinities. The lava flow maps cover 11% of the Martian globe. Larger scale geologic maps are presented only by seven 1:500,000 sheets.

SUMMARY. Cartographic coverage of Mars is sufficiently regular. But this coverage being at 1:2,000,000 scale should be considered now only as reconnaissance one. Same could be ruled out for the geologic mapping which covers the whole planet only with 1:5,000,000-scale maps. No another (but geologic) thematic maps exist for Mars with more or less regular coverage. The future studies, in particular with MARS-94 mission, should lead to the diversity of the thematic map types [2] for the whole planet or its considerable regions.

REFERENCES: 1. J.L.Inge, R.M.Batson (1992) Indexes of maps the planets and satellites 1992. NASA TM 4395. 2.G.A.Burba (1993) Thematic map types possible for Mars ... - This volume.

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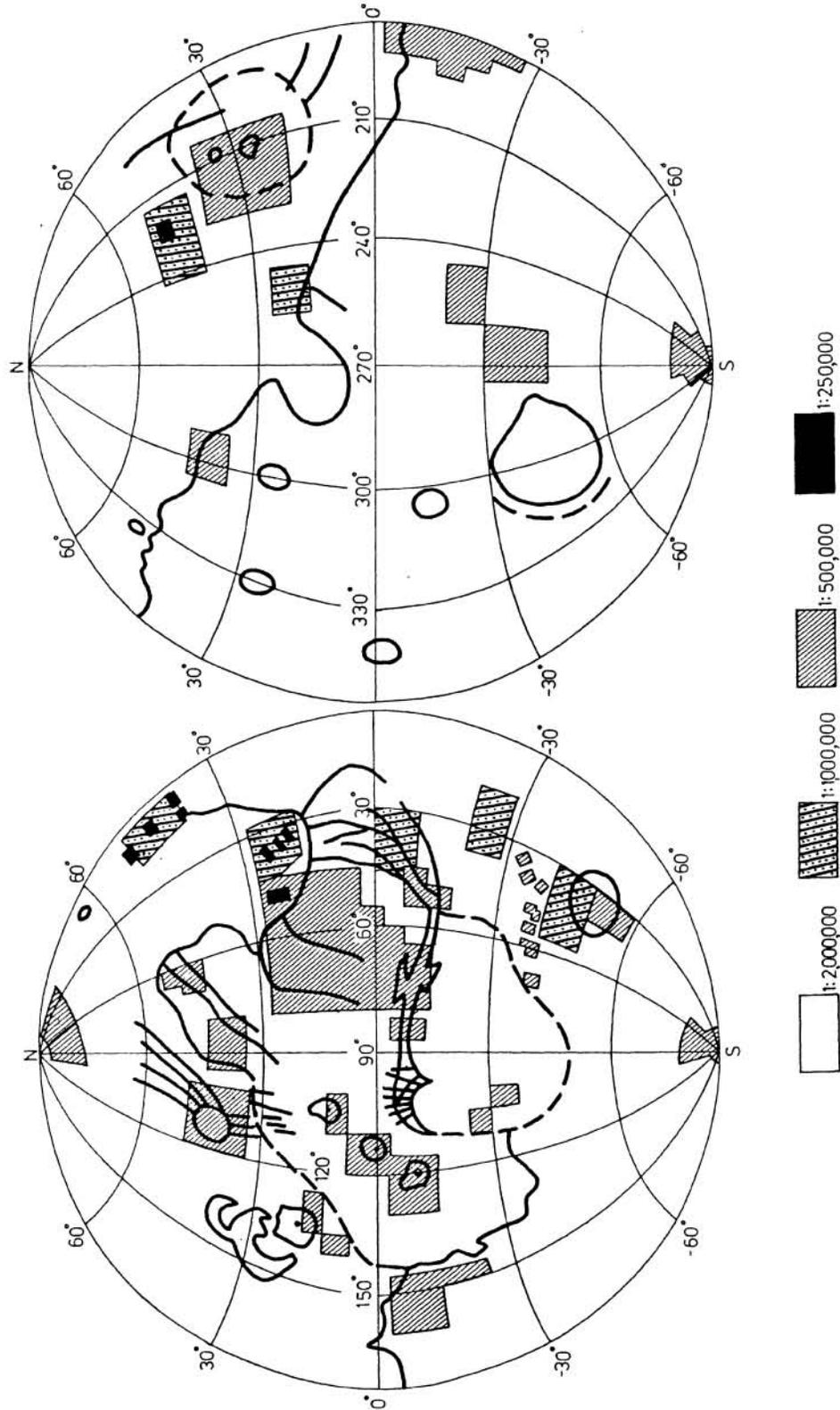


Fig.1. Cartographic Coverage of Mars  
Largest Scale Exists for the Area is shown