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

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF MARS
1:5,000,000 TOPOGRAPHIC SERIES
OXIA PALUS QUADRANGLE
M 5M 15/22 CCM, 1997
I-2482 (MC-11) SHEET 2 OF 2

NOTES ON BASE

This photomosaic was created by merging two global digital image models (DIM's) of Mars—a medium resolution monochrome mosaic processed to emphasize topographic features and a lower resolution color mosaic emphasizing color and albedo variations.

The medium-resolution (1/256° or roughly 231 m per pixel) monochromatic image model (Batson and Eliason, 1995) was constructed from about 6,000 images with resolutions of 150–350 m/pixel and oblique illumination (Sun 20°–45° above the horizon). (Many of these images were also used in the construction of the 1:2,000,000 hand-laid controlled photomosaic series and the 1:5,000,000 photomosaics, which the present product supersedes.) Geometric control of the medium-resolution DIM was based on a refined topographic control network by Wu and Schafer (1984), which was based on the network of Davies and Katayama (1983). A low-resolution mosaic of the Wu and Schafer images was made, and the medium-resolution features were matched to this by using features (not necessarily control points) visible in both datasets. Remaining positional discrepancies were redistributed smoothly and are typically less than 20 pixels. Radiometric processing of the medium-resolution DIM was intended to suppress or remove the effects of albedo variations through the use of a high-pass divide filter, followed by photometric normalization so that the contrast of a given topographic slope would be approximately the same in all images.

The global color mosaic (McEwen and Soderblom, 1993) was assembled at 1/64° or roughly 864 m/pixel from about 1,000 red- and green-filter images with 500–1,000 m/pixel resolution. These images were first mosaicked in groups, each taken on a single orbit of the Viking spacecraft. The orbit mosaics were then processed to remove spatially and temporally varying atmospheric haze in the overlap regions. After haze removal, the per-orbit mosaics were photometrically normalized to equalize the contrast of albedo features and mosaicked together with cosmetic seam removal. The medium-resolution DIM was used for geometric control of this color mosaic. A green-filter image was synthesized by weighted averaging of the red- and violet-filter mosaics. Finally, the product seen here was obtained by multiplying each color image by the medium-resolution monochrome image.

The color balance selected for images in this map series was designed to be close to natural color for brighter, redder regions, such as Arabia Terra and the Tharsis region, but the data have been stretched so that the relatively dark regions appear darker and less red than they actually are.

NOMENCLATURE

MC–11: Abbreviation for Mars Chart 11.

M 5M 15/22 CCM: Abbreviation for Mars, 1:5,000,000 series; center of sheet, lat 15° N., long 22°; controlled color photomosaic (CCM).

REFERENCES

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Davies, M.E., and Katayama, F.Y., 1983, The 1982 control network of Mars: Journal of Geophysical Research, v. 88 (B9), p. 7403–7404.

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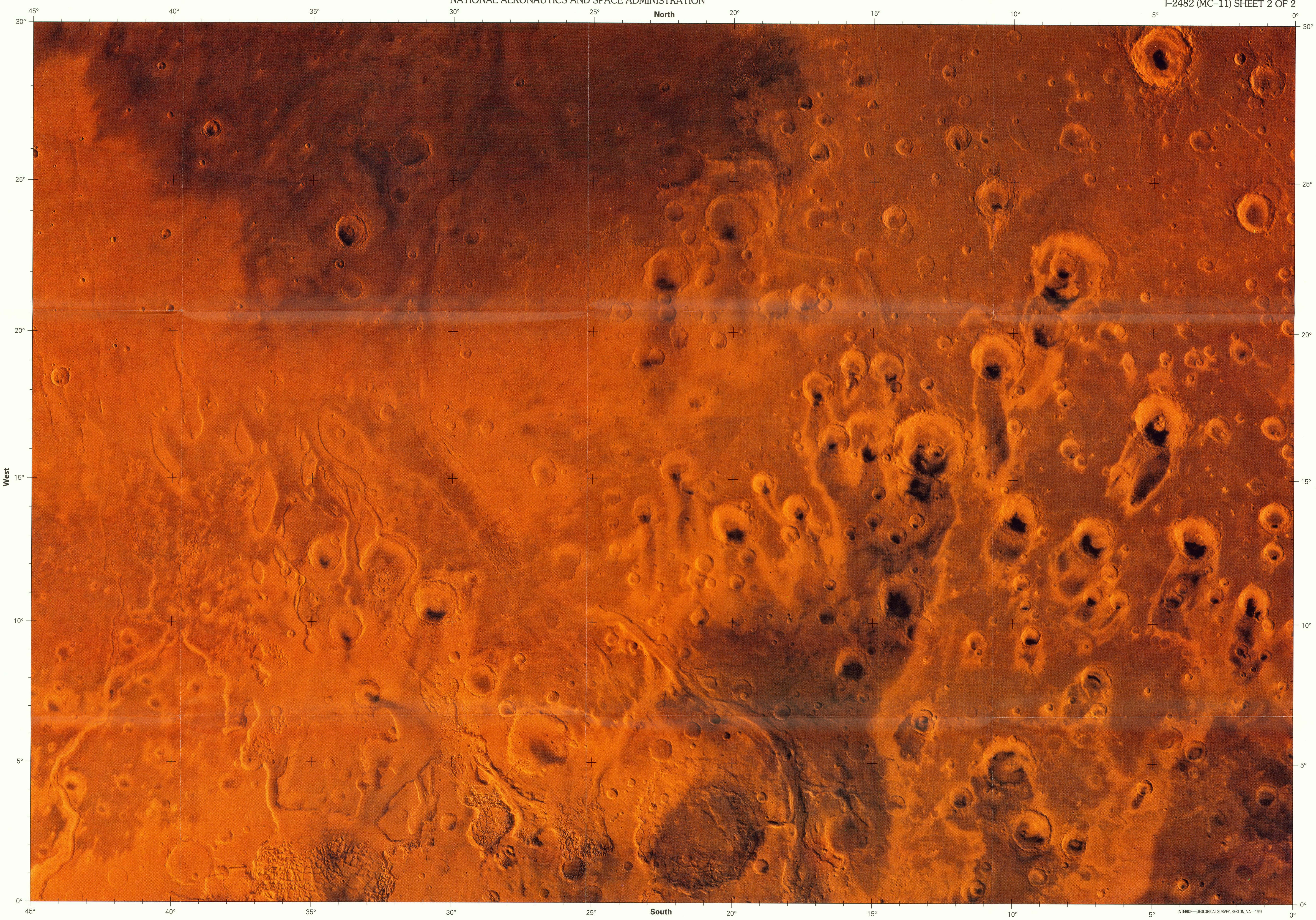

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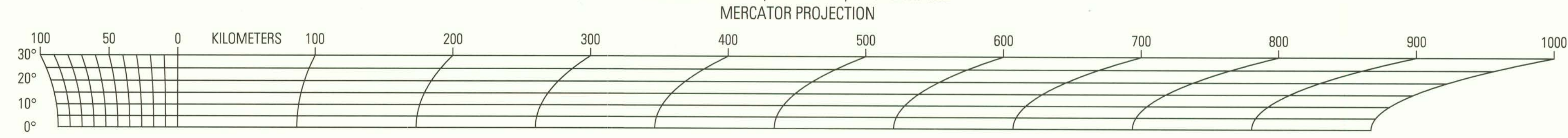
SCALE 1:5 000 000 (1 mm = 5 km) AT 0° LATITUDE
MERCATOR PROJECTION



CONTROLLED COLOR PHOTOMOSAIC OF THE OXIA PALUS QUADRANGLE (MC–11) OF MARS

1997