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16 Abstract

This publication is a brief guide to the maps of Mars which contain the Viking 1 and Viking 2 landing sites. Included are maps and photomosaics originally produced at the following scales--1:25 million, 1:15 million, 1:5 million, 1:2 million, 1:1 million, and 1:250,000. In each case the Viking locations are indicated on the maps and photomosaics.

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The Viking Lander Sites- A Cartographic Perspective

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The Viking Lander Sites--A Cartographic Perspective

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ABSTRACT

This publication is a brief guide to the maps of Mars which contain the Viking 1 and Viking 2 landing sites. Included are maps and photomosaics originally produced at the following scales -- 1:25 million, 1:15 million, 1:5 million, 1:2 million, 1:1 million, and 1:250,000. In each case the Viking locations are indicated on the maps and photomosaics.

CONTENTS

INTRODUCTION

Over the past decade hundreds of maps have been produced by the U.S. Geological Survey in Flagstaff, Arizona showing the surface of Mars as imaged by spacecraft. Those maps that contain the Viking 1 and Viking 2 Lander locations have been selected for this publication, which is meant to be used as a guide for readers who are interested in obtaining cartographic products of the landing sites.

Two factors must be considered when selecting Mars maps--map scale and map type.

Map scale. Maps of Mars are available at the following scales: 1:25 million, 1:15 million, 1:5 million, and 1:2 million. In addition, maps are available of selected areas at 1:1 million, 1:500,000, 1:250,000, and 1:50,000 scale.

Map type. The following types of maps are available for the Viking sites.

Shaded relief maps present three-dimensional representations of the martian surface. They are produced by a cartographer using special airbrush techniques. All appropriate spacecraft photographs of the area being mapped are used as source material by the cartographer. The final maps show the landscape with the most detail possible and under uniform illumination (most maps displayed in this document are shaded relief maps).

Topographic maps are shaded relief maps containing contour lines which show altitudes above and below an elevation selected as "0." On Earth this "0" elevation is usually sea level but, because Mars has no oceans, sea level cannot be used. The "0" elevation on Mars is now defined as that line where the mean atmospheric pressure at the surface is equivalent to the triple-point pressure of water (the pressure at which water can exist as a solid, liquid, or gas); this is a pressure of 6.1 millibars. Topographic maps may also include albedo (light and dark) markings of the martian surface (because albedo markings on Mars change with time, their locations should be considered as only approximate).

Geologic maps often use shaded relief maps as a base and, by the use of colors and symbols, denote the various geologic units and structures of Mars.

Photomosaics are composed of spacecraft photographs that often have been computer enhanced and rectified to fit a selected map projection (photomosaics are also displayed in this document).

The following information is included for each of the maps presented in this publication:

(a) map name and Mars Chart (MC) designation, if appropriate

(b) original scale (before reduction for this document)

(c) map types available for each region with their corresponding index numbers (I-numbers)

(d) the map location on the overall coordinate grid of Mars

The Viking landing site is indicated by a small cross on each map; arrows at the map edges help to locate these crosses. The letter "N" indicates north.

The mapping of Mars is an on-going process; old charts are being revised and new charts are being produced. For information on the maps presently available and how to obtain them, write to:

National Cartographic Information Center
U.S. Geological Survey
507 National Center
Reston, Virginia 22092

or

U.S. Geological Survey
2255 N. Gemini Drive
Flagstaff, Arizona 86001

Several of the illustrations used in this publication (those with "H" numbers) are available as photographic prints, slides, or overhead transparencies from NASA. For information, write to:

Audio-Visual Branch
Code LFD-10
National Aeronautics and Space Administration
Washington, D.C. 20546

Educators and scientists may also obtain photographic products from the following:

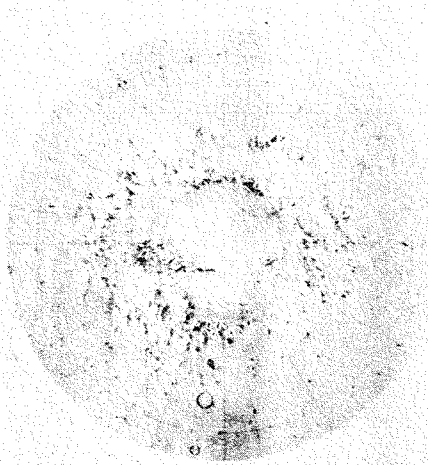
National Space Science Data Center
Code 633
Goddard Space Flight Center
Greenbelt, Maryland 20771

Many Mars maps and photographs (as well as maps and photographs of other planets) are available for viewing at Regional Planetary Image Facilities. A list of these facilities is included in the Appendix.

A suggested reading list about Mars is included at the end of this document. In particular, "Planetary Cartography in the Next Decade: 1984-1994" describes the planetary cartographic program of NASA and the U.S. Geological Survey.

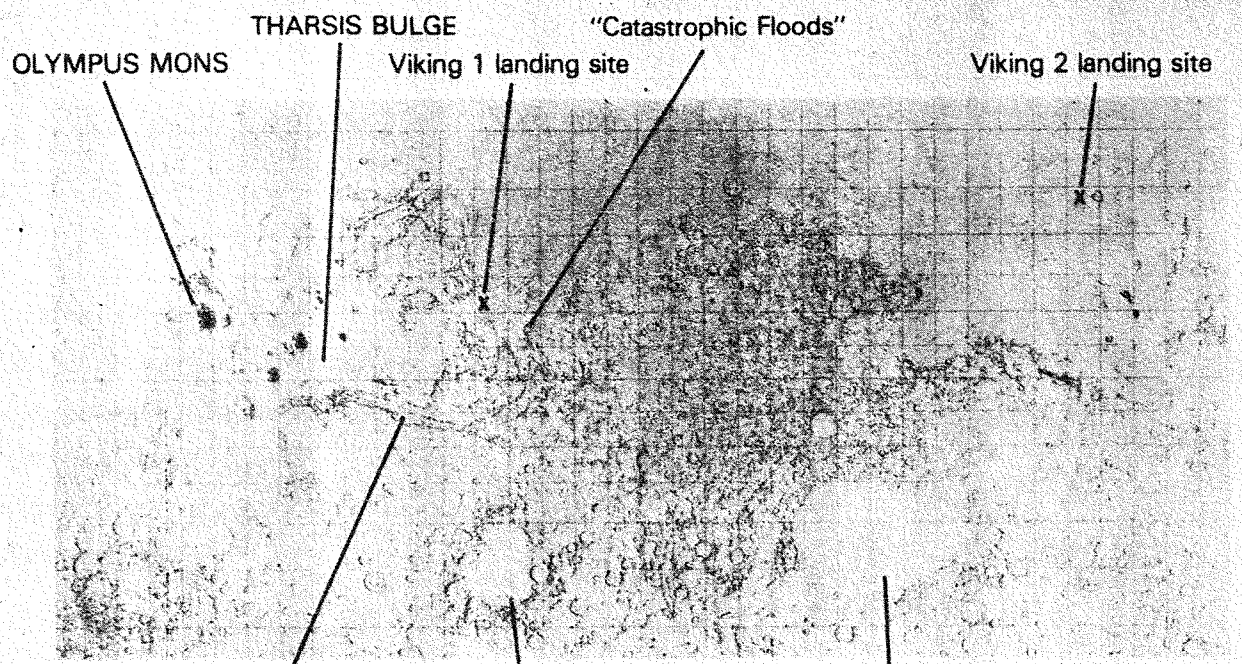
Map 1: Mars
Original scale 1:25 million
Shaded relief map order number I-940
Topographic map order number I-961
Geologic map order number I-1083
Photograph order number 84 H 594

MARS



NORTH POLAR REGION

SOUTH POLAR REGION



Viking 1

Map 2: Western Region of Mars

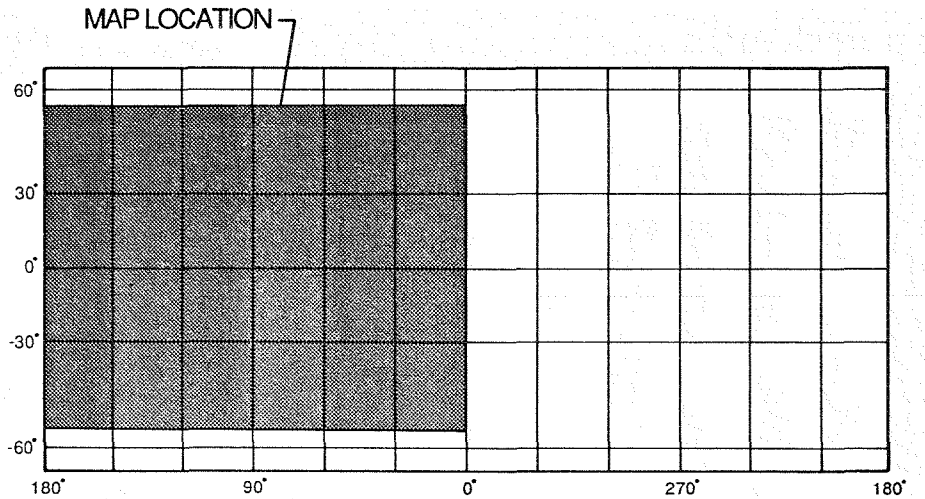
Original scale 1:15 million

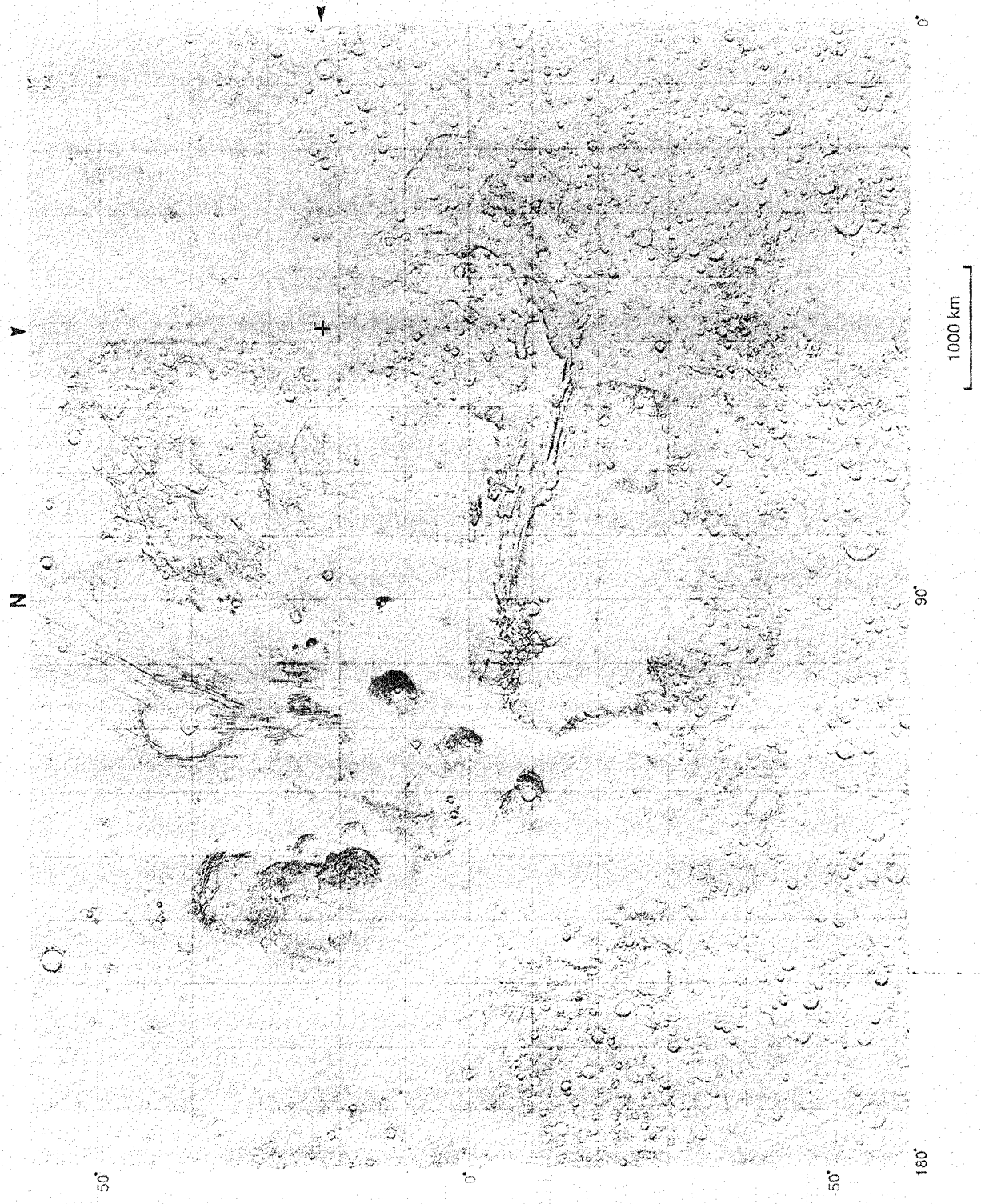
Shaded relief map order number I-1320

Shaded relief map (with nomenclature) order number I-1618

Shaded relief map (with nomenclature and albedo markings) order number I-1535

Geologic map order number I-1802A

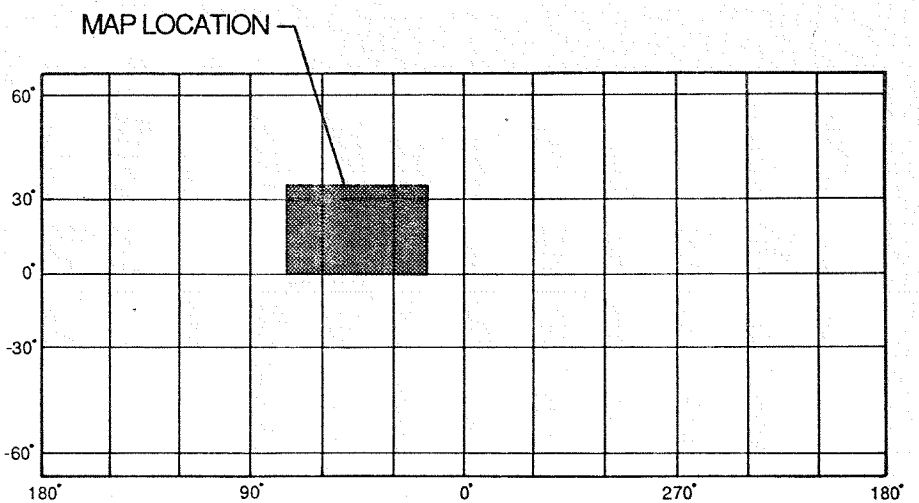


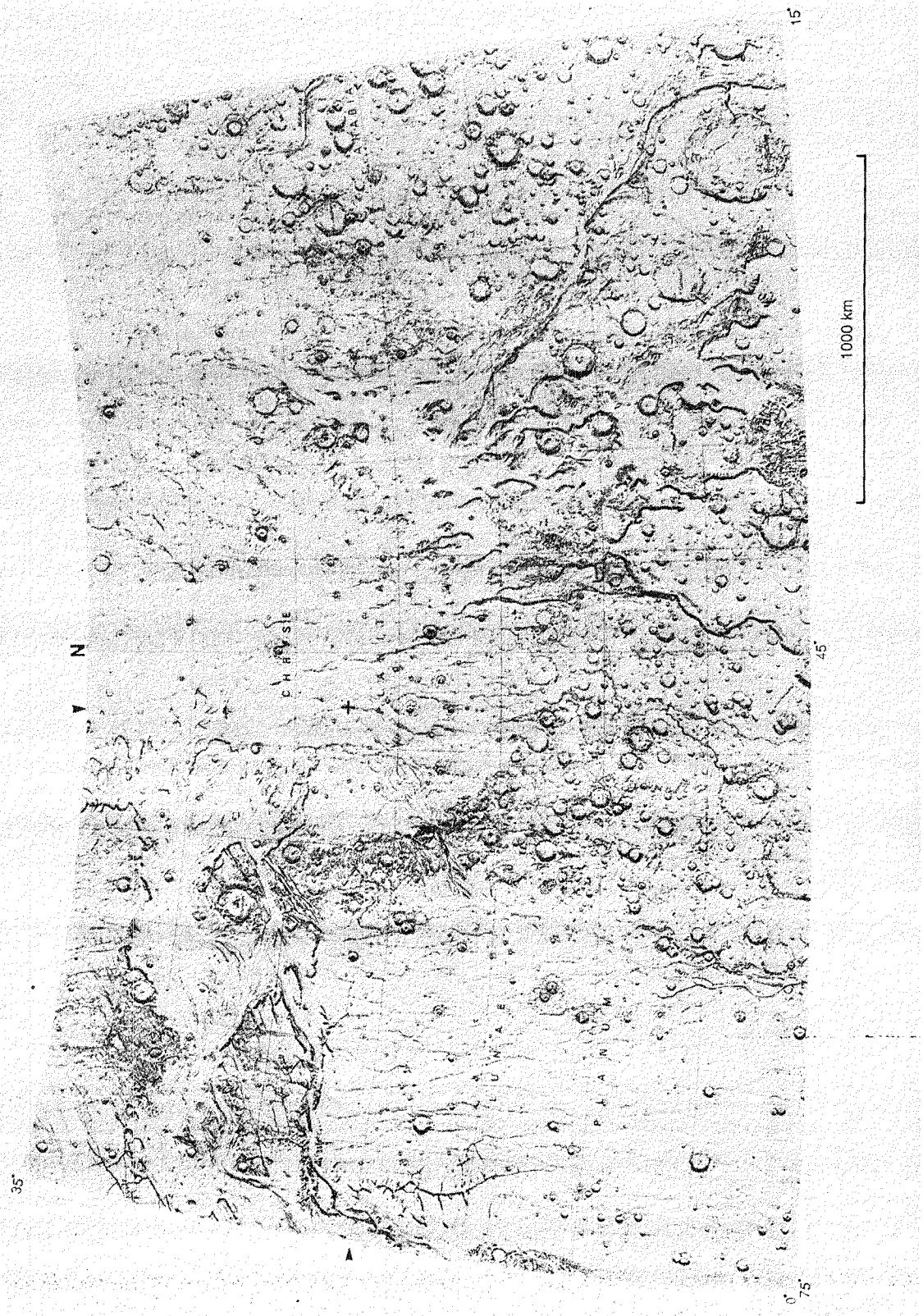


Viking 1

Map 3: Chryse Planitia Region
Original scale 1:5 million
Shaded relief map order number I-1448
Photograph order number 85 H 59

Also available (but not shown) is the Lunae Palus Quadrangle (MC-10) which contains the landing site.
Scale: 1:5 million
Shaded relief map order number I-1511
Topographic map order number I-971
Geologic map order number I-894



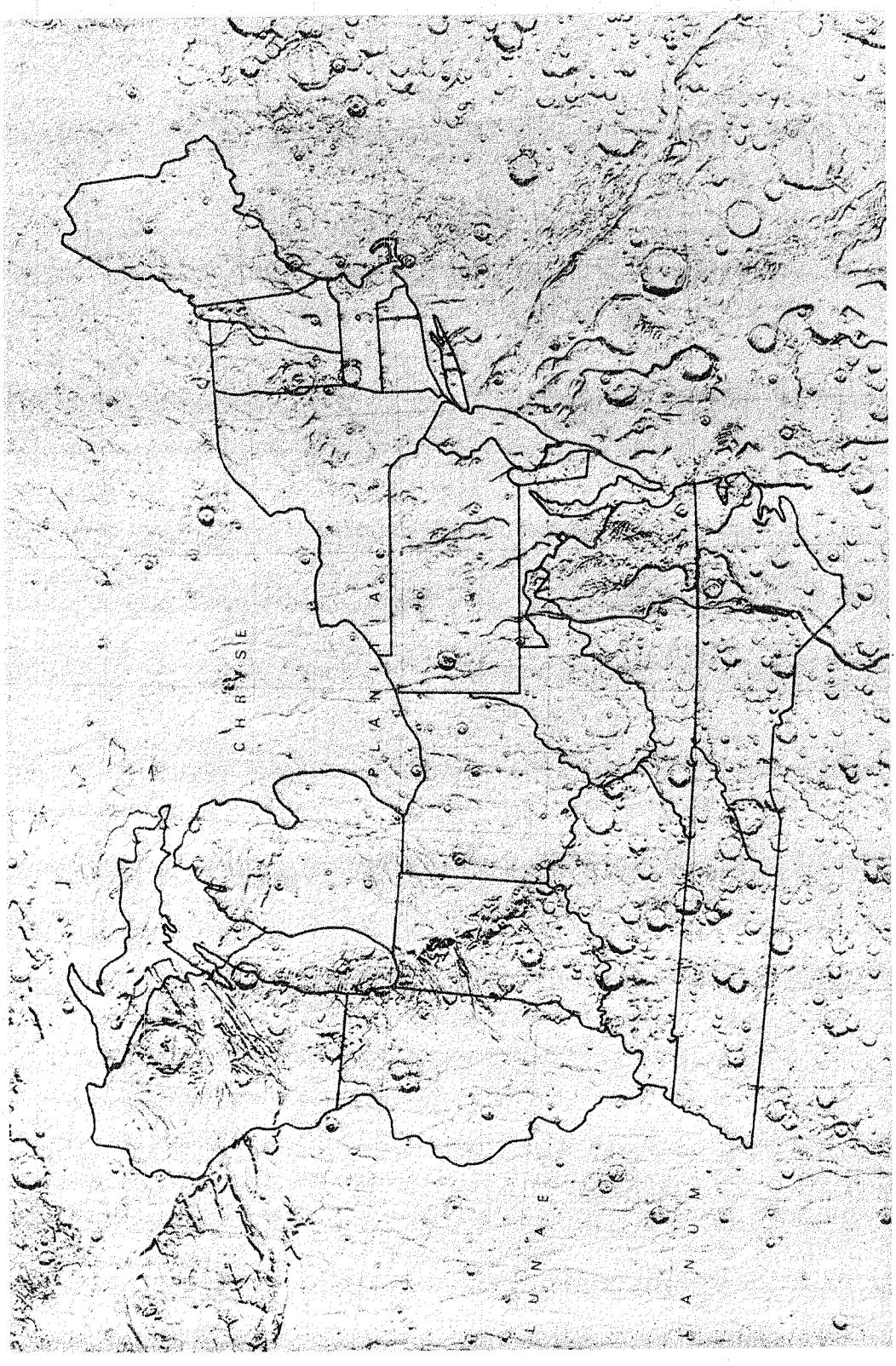


Viking 1

Map 4: Chryse Planitia Region-NE U.S. Comparison

Photograph order number 85 H 60

This composite visual shows the Northeast United States at the same scale as Map 3.



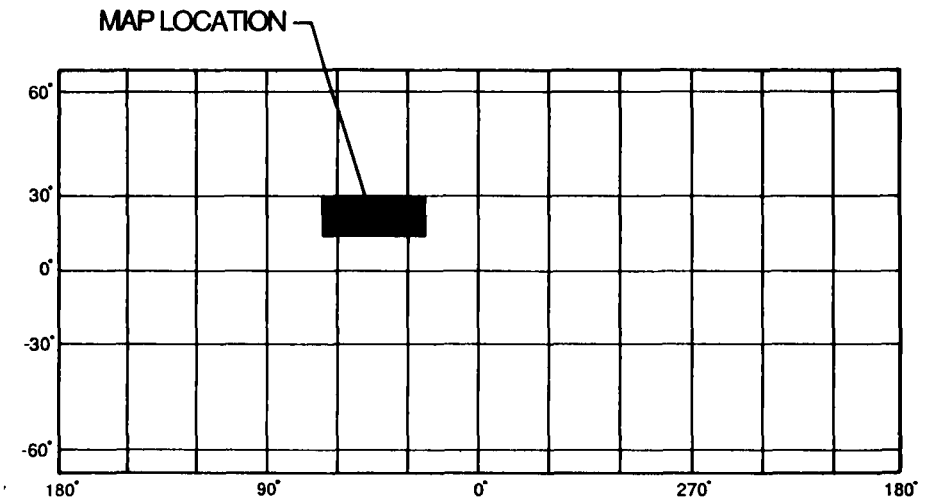
Map 5: Lunae Palus NE Quadrangle (MC-10 NE) and Oxia Palus NW Quadrangle (MC-11 NW)

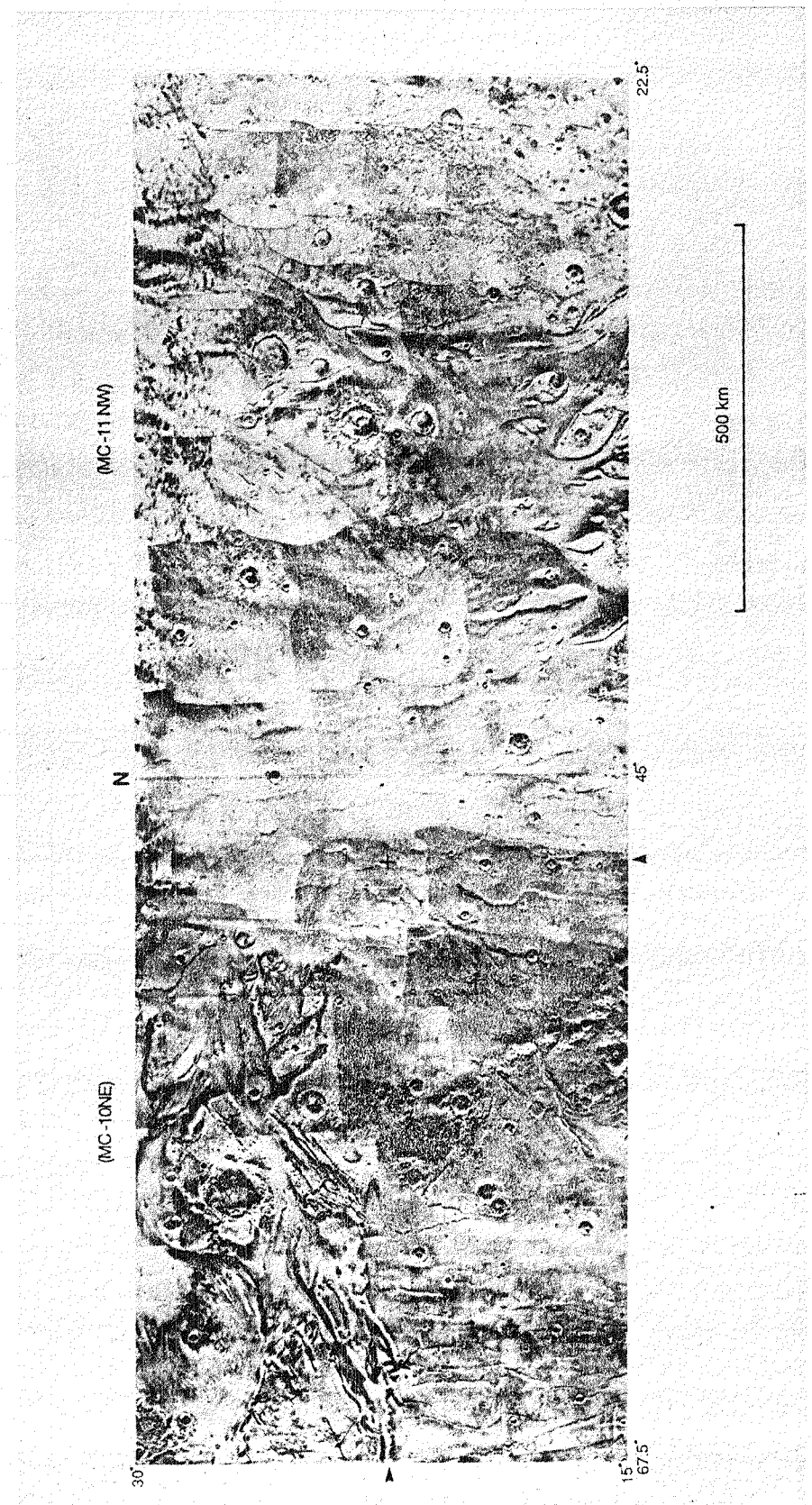
Original scale 1:2 million

Photomosaic order numbers,

Lunae Palus NE: I-1305

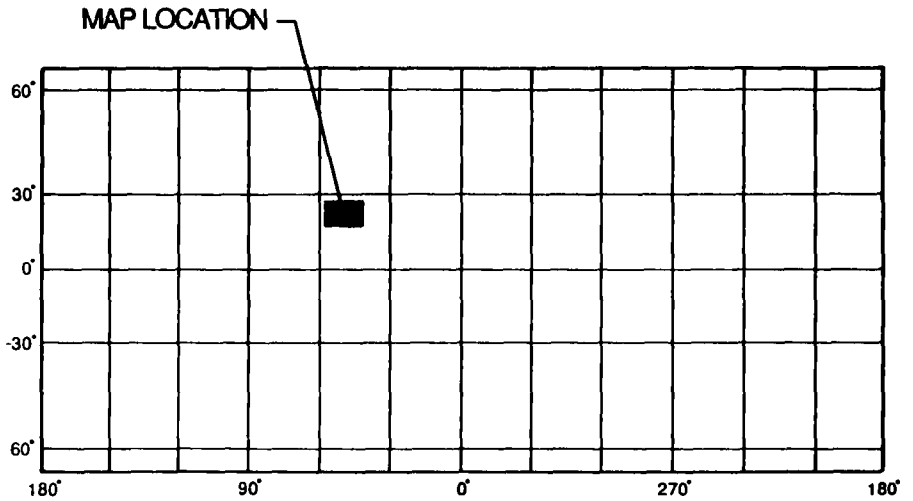
Oxia Palus NW: I-1345

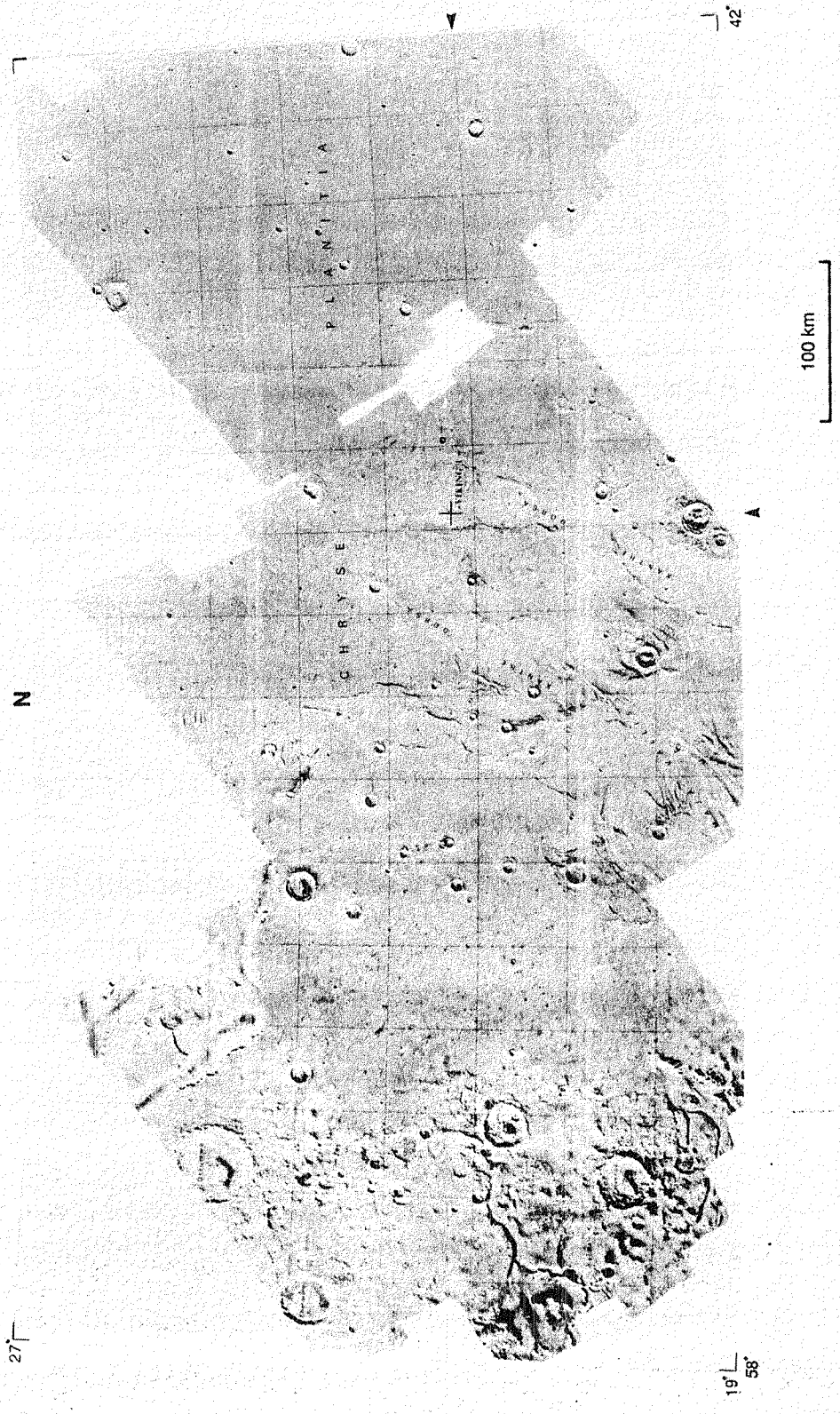




Viking 1

Map 6: Western Chryse Planitia Region
Original scale 1:1 million
Photomosaic order number I-1068



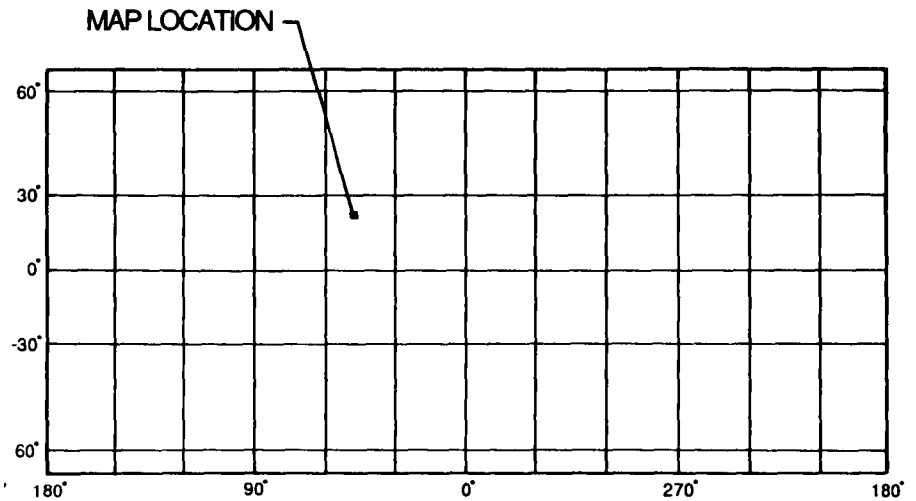


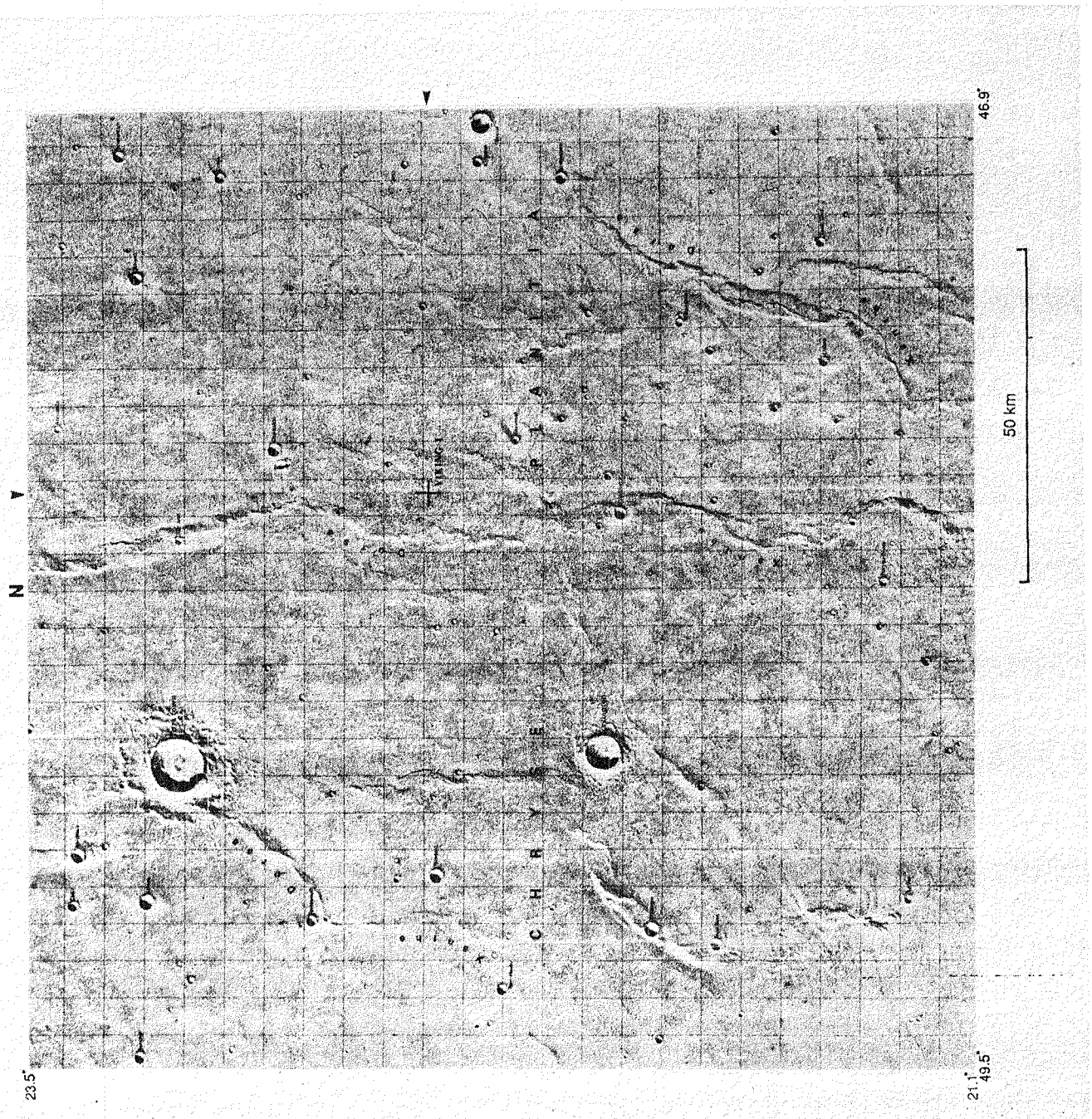
Viking 1

Map 7: Yorktown Region

Original scale 1:250,000

Photomosaic order number I-1059





Viking 2

Map 8: Eastern Region of Mars

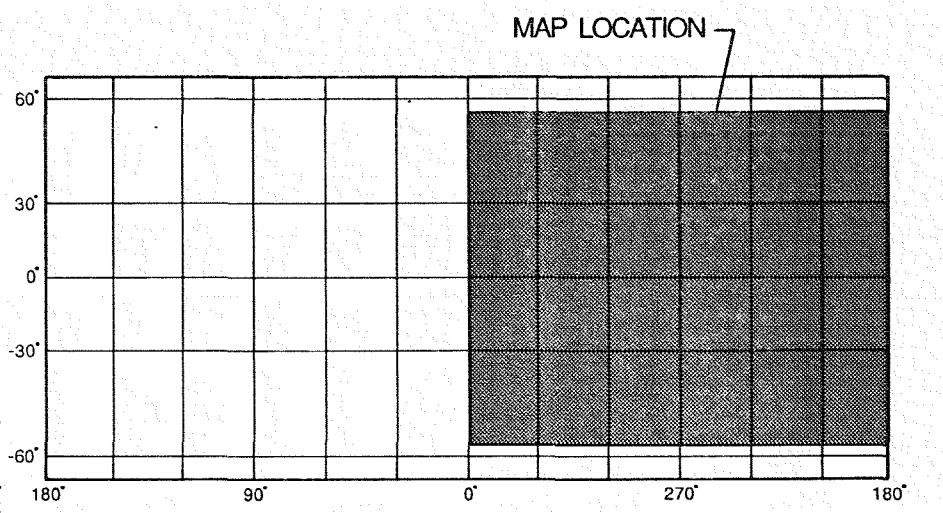
Original scale 1:15 million

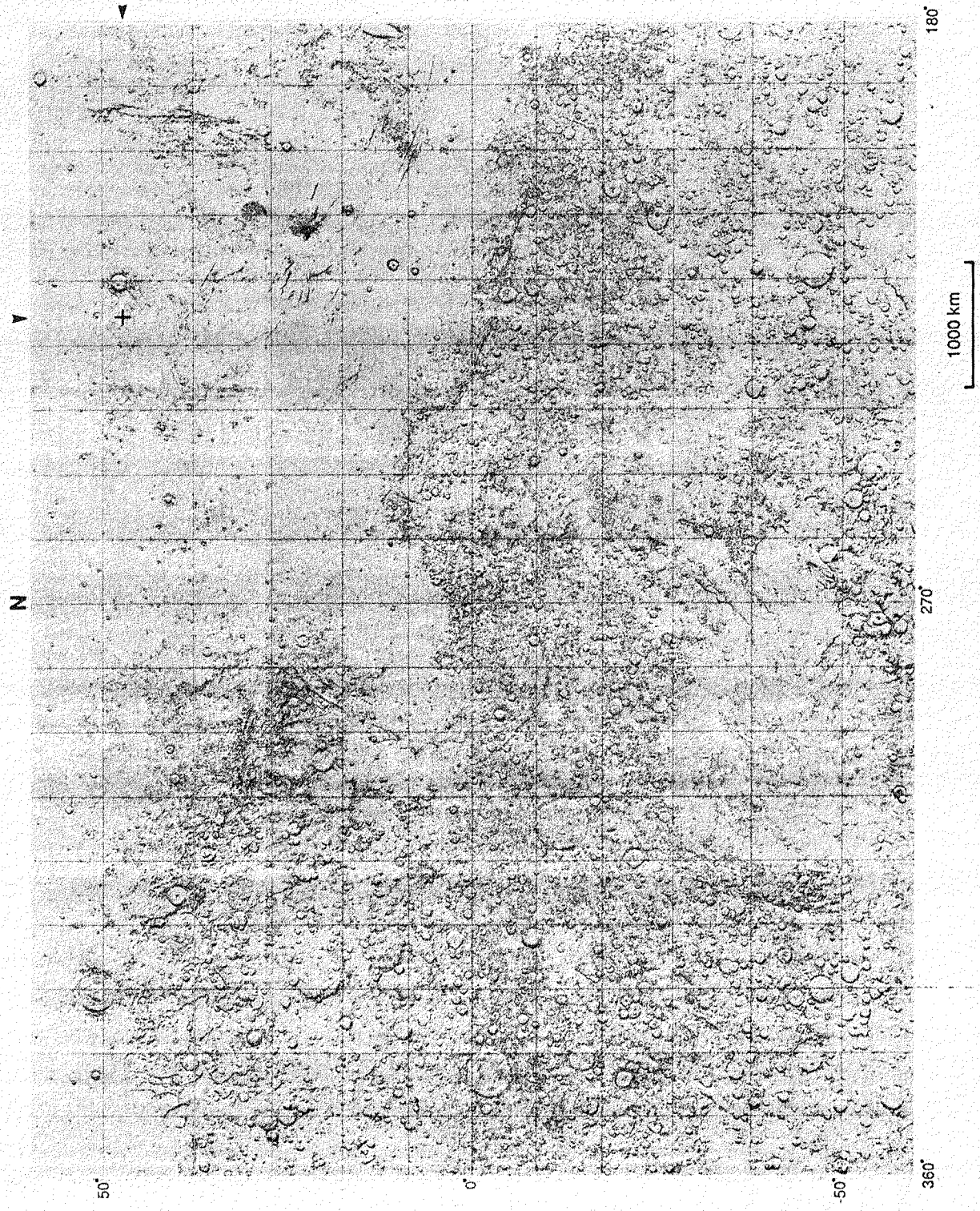
Shaded relief map order number I-1321

Shaded relief map (with nomenclature) order number I-1618

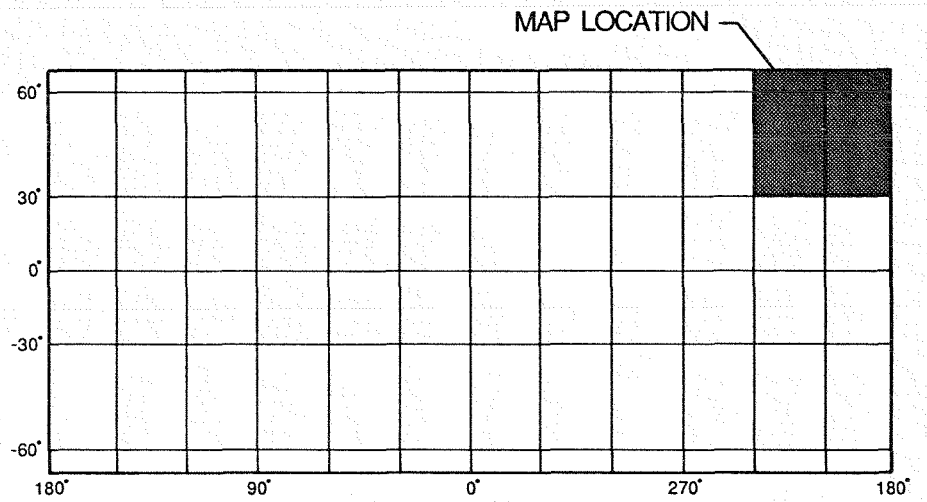
Shaded relief map (with nomenclature and albedo markings) order number I-1535

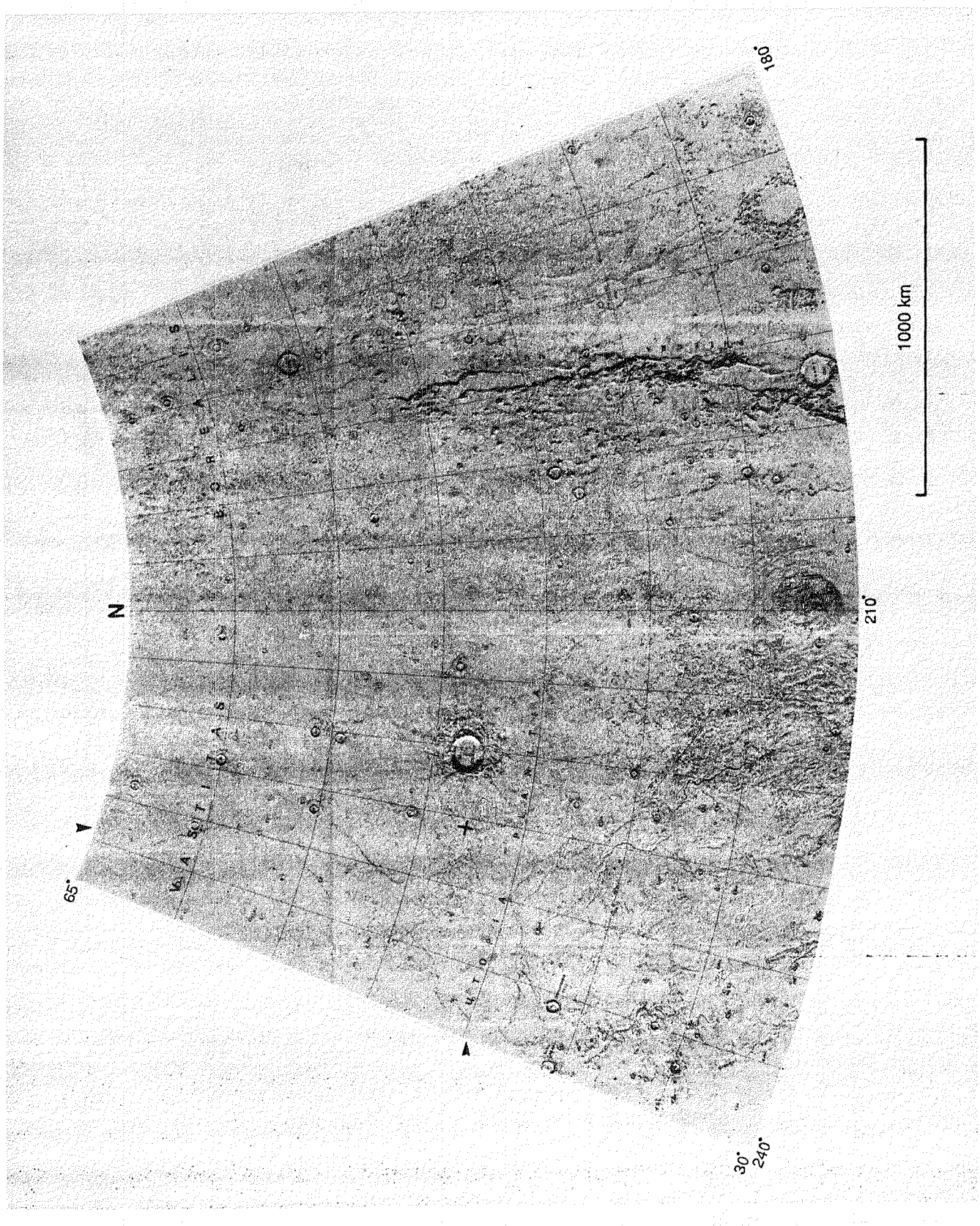
Geologic map order number I-1802B





Map 9: Cebrenia Quadrangle (MC-7)
Original scale 1:5 million
Shaded relief map order number I-1475
Topographic map order number I-1120
Geologic map order number I-1140





Map 10: Cebrenia NW Quadrangle (MC-7 NW),
Cebrenia S-C Quadrangle (MC-7 S-C), and
Cebrenia SW Quadrangle (MC-7 SW)

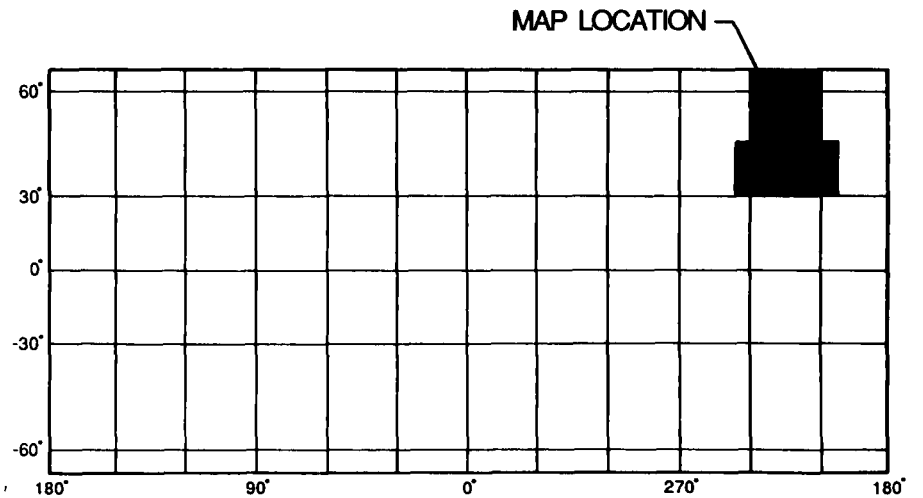
Original scale 1:2 million

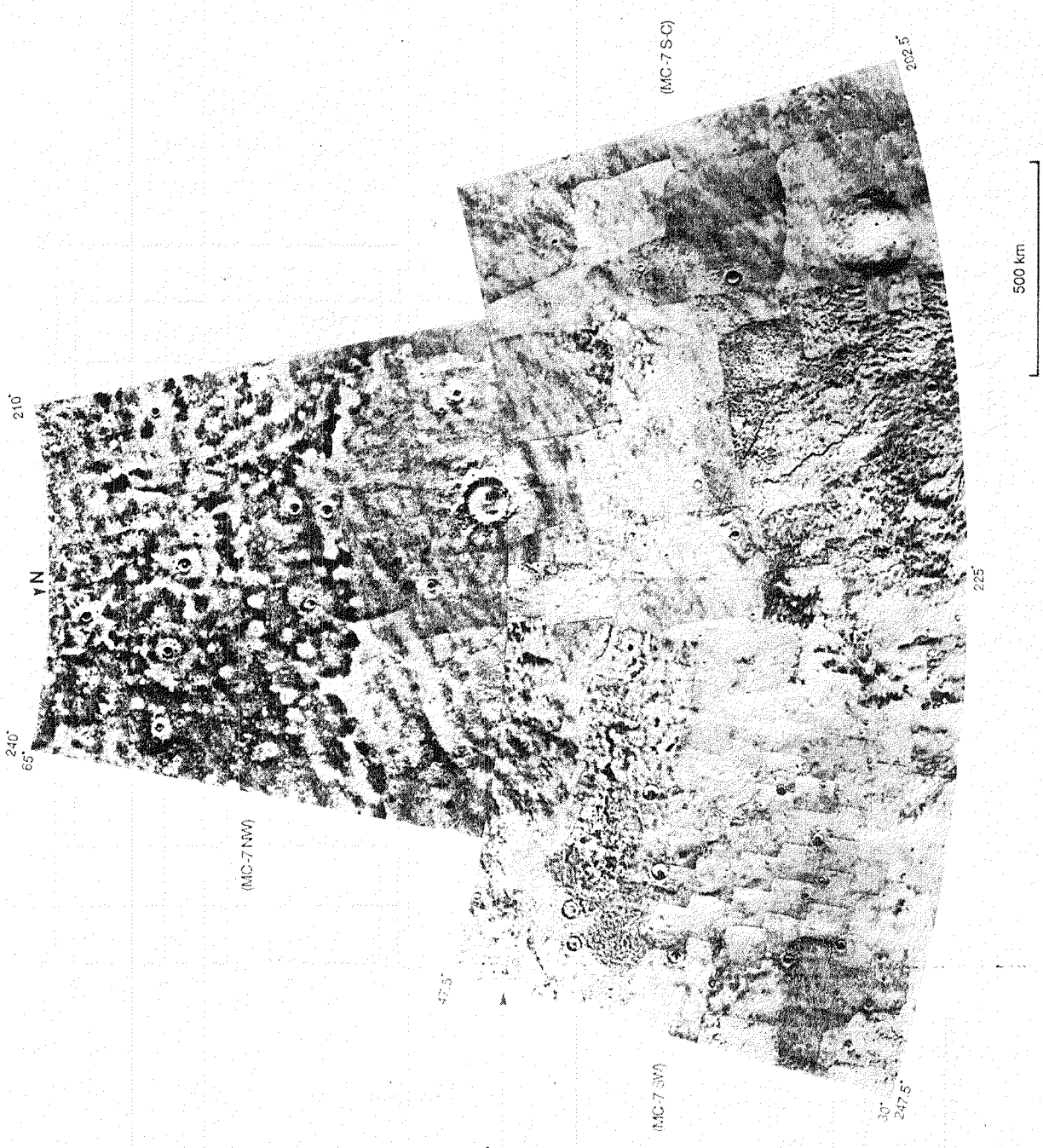
Photomosaic order numbers,

Cebrenia NW: I-1521

Cebrenia S-C: I-1398

Cebrenia SW: I-1564



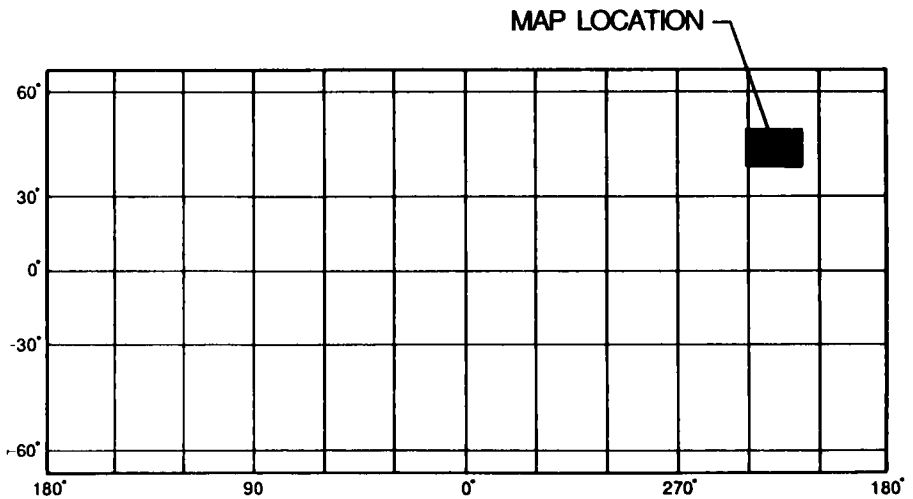


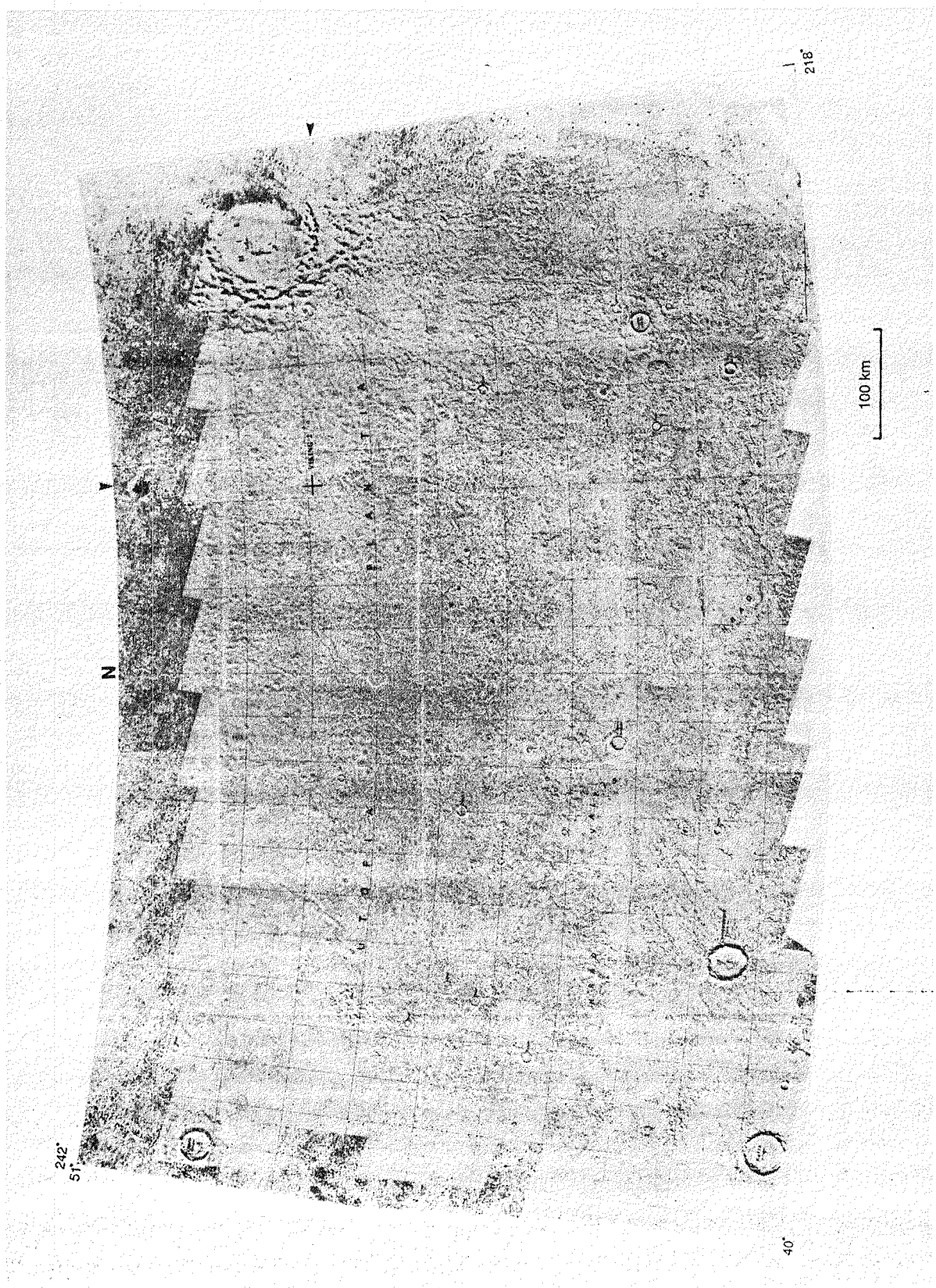
Viking 2

Map 11: Utopia Planitia Region

Original scale 1:1 million

Photomosaic order number I-1061



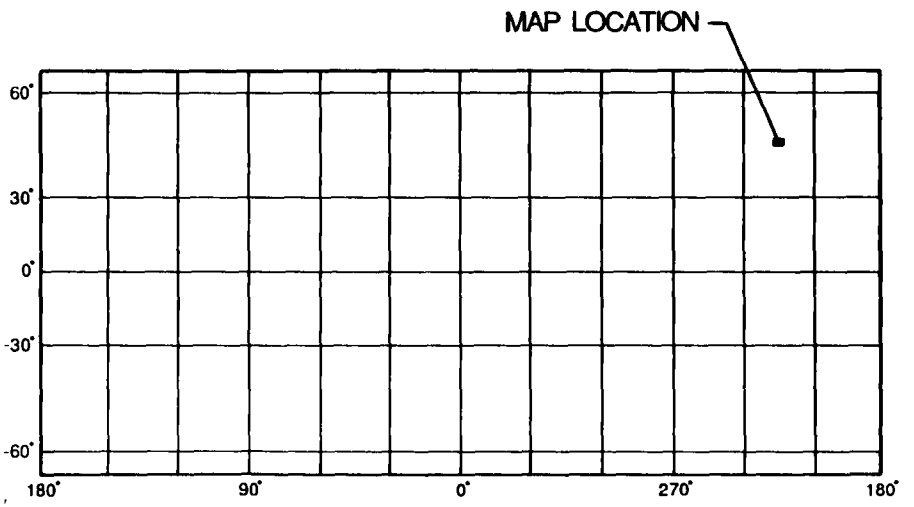


Viking 2

Map 12: Canberra Region

Original scale 1:250,000

Photomosaic order number I-1060



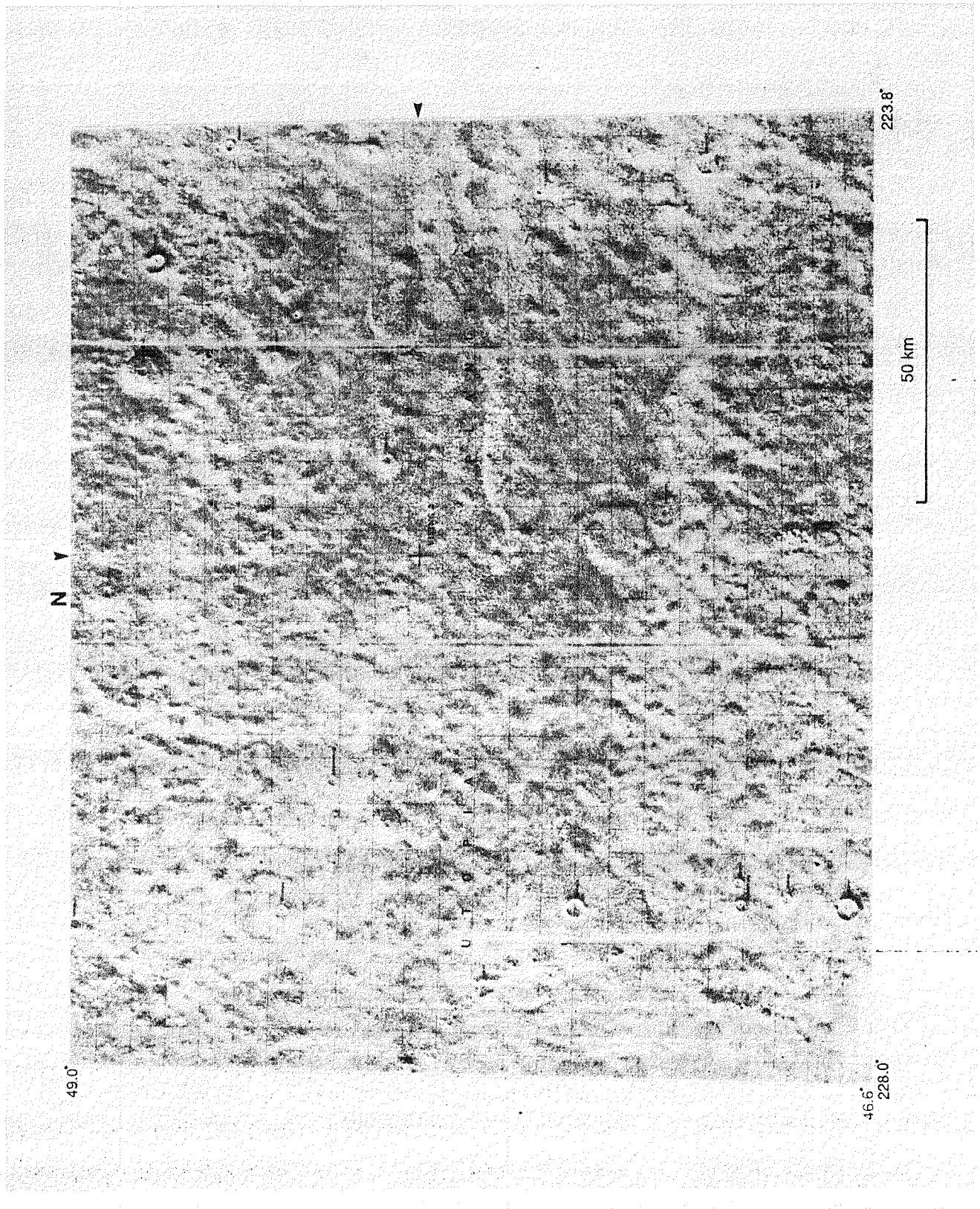
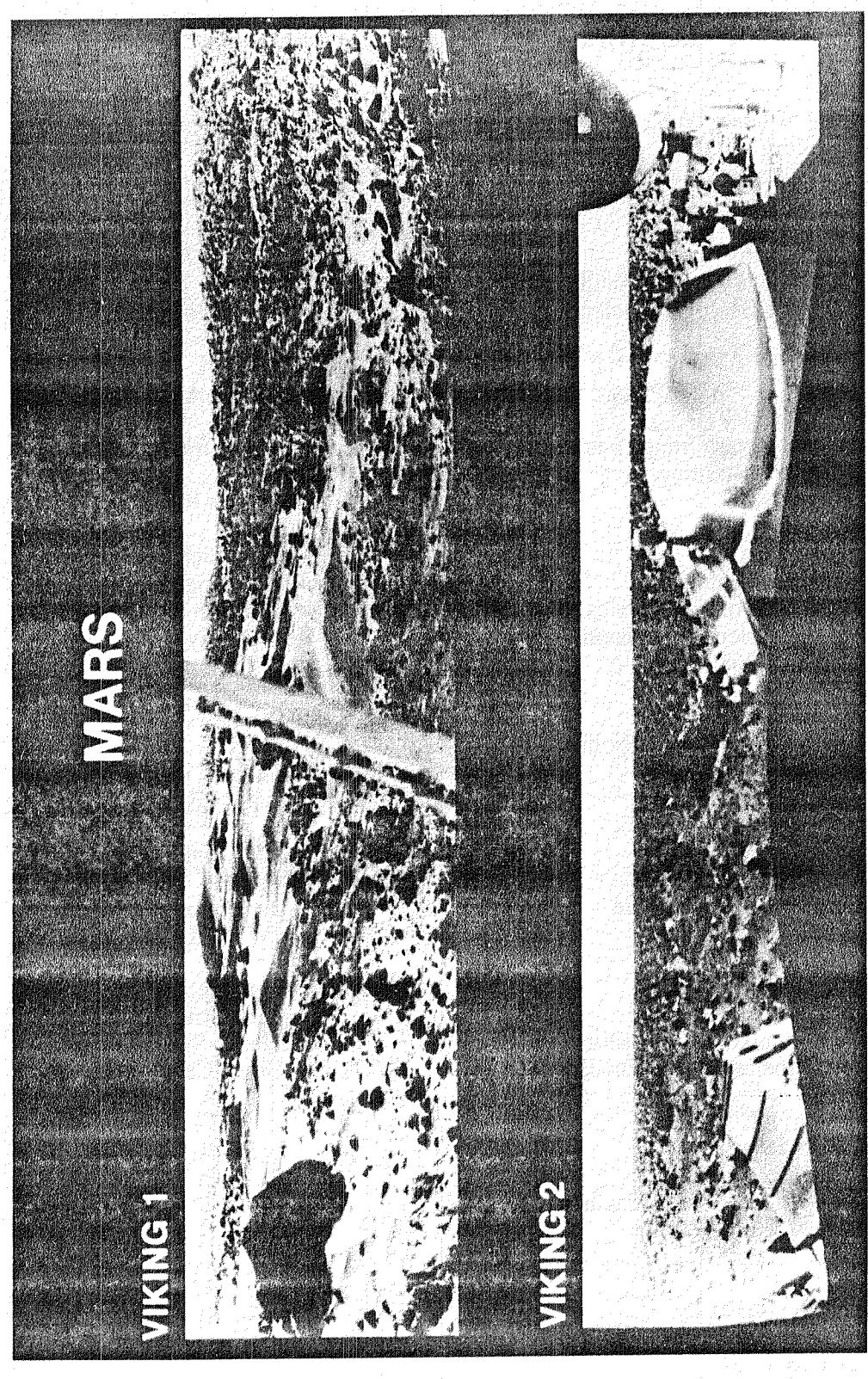


Plate 1: The Viking Landing Sites

Photograph order number 83 H 253

It seems appropriate to end this series of maps with panoramic surface photos of both the Viking 1 and Viking 2 landing sites.



Appendix

REGIONAL PLANETARY IMAGE FACILITIES

University of Arizona
Space Imagery Center
Lunar and Planetary Laboratory
Tucson, AZ 85721

Brown University
Regional Planetary Image Facility
Department of Geological Sciences
Box 1846
Providence, RI 02912

Cornell University
Spacecraft Planetary Image Facility
Space Sciences Building
Ithaca, NY 14853

University of Hawaii
Planetary Data Center
Hawaii Institute of Geophysics
Planetary Geosciences Division
Honolulu, HI 96822

Jet Propulsion Laboratory
Regional Planetary Image Facility
M/S 264-786
4800 Oak Grove Drive
Pasadena, CA 91109

Johnson Space Center
Lunar and Planetary Institute
Planetary Image Center
3303 Nasa Road 1
Houston, TX 77058

National Air and Space Museum
Regional Planetary Image Facility
Room 3103
Washington, DC 20560

U.S. Geological Survey
Regional Planetary Image Facility
2255 North Gemini Drive
Flagstaff, AZ 86001

Washington University
Regional Planetary Image Facility
Campus Box 1169
St. Louis, MO 63130

Branch Facilities

Arizona State University
Space Photography Laboratory
Department of Geology
Tempe, AZ 85287

Louisiana State University
Department of Geology
Baton Rouge, LA 70803

Foreign Facilities

Southern Europe Regional Planetary
Image Facility
Instituto Astrofisica Spaziale
Reparto Planetologia
Viale Universita'n.ll
00185 Roma, Italy

DFVLR
Oberpfaffenhofen
NE-OE-PE
8031 Wessling
West Germany FRG

University of London Observatory
33/35 Daws Lane
Observatory Annex
London, NW7 4SD England

Laboratoire de Geologie
dynamique interne (bat. 509)
Universite Paris-Sud
F-91 405 Orsay Cedex - France

SUGGESTED READING

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Mutch, T., et al., The Martian Landscape, *NASA SP-425*: U.S. Government Printing Office, Washington, D.C., 1978.

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Spitzer, C., editor, et al., Viking Orbiter Views of Mars, *NASA SP-441*: U.S. Government Printing Office, Washington, D.C., 1980.

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