

**No. 148 MARS — 1967 PHOTOGRAPHIC MAP**

*by* STEPHEN LARSON

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**ABSTRACT**

A map of Mars was constructed based on photographs taken with the 154 cm NASA telescope of the Catalina Observatory from March 15 to May 20, 1967. Photographs covering 6000 to 8900 Å were used to optimize seeing and minimize the reduction of contrast by the Martian atmosphere.

Good photographic coverage of Mars during the 1967 opposition, March 15 to May 20, was obtained with the NASA 154 cm telescope of the Catalina Observatory by Fountain, McLean and Larson. This presented the opportunity to produce a map (Figs. 2-3) which serves as a base for plotting cloud motions and other Martian atmospheric phenomena and by which surface changes may be detected in future oppositions.

More than 130 rolls of 35 mm film were taken during the opposition. Only a few frames were used

here and a more complete series will be presented at a later date. Only red and near-infrared photographs (6000 to 8900Å) were used for the map so that contrast reduction by the Martian atmosphere was minimized. Good-quality photographs taken with Kodak High Speed Ektachrome were copied on film with a Wratten 25 filter to correspond to red exposures. Composites of 2 - 12 images were made which reduces the chance of displacements due to poor atmospheric seeing. The Mars prints were more than 6 cm in diameter and care was

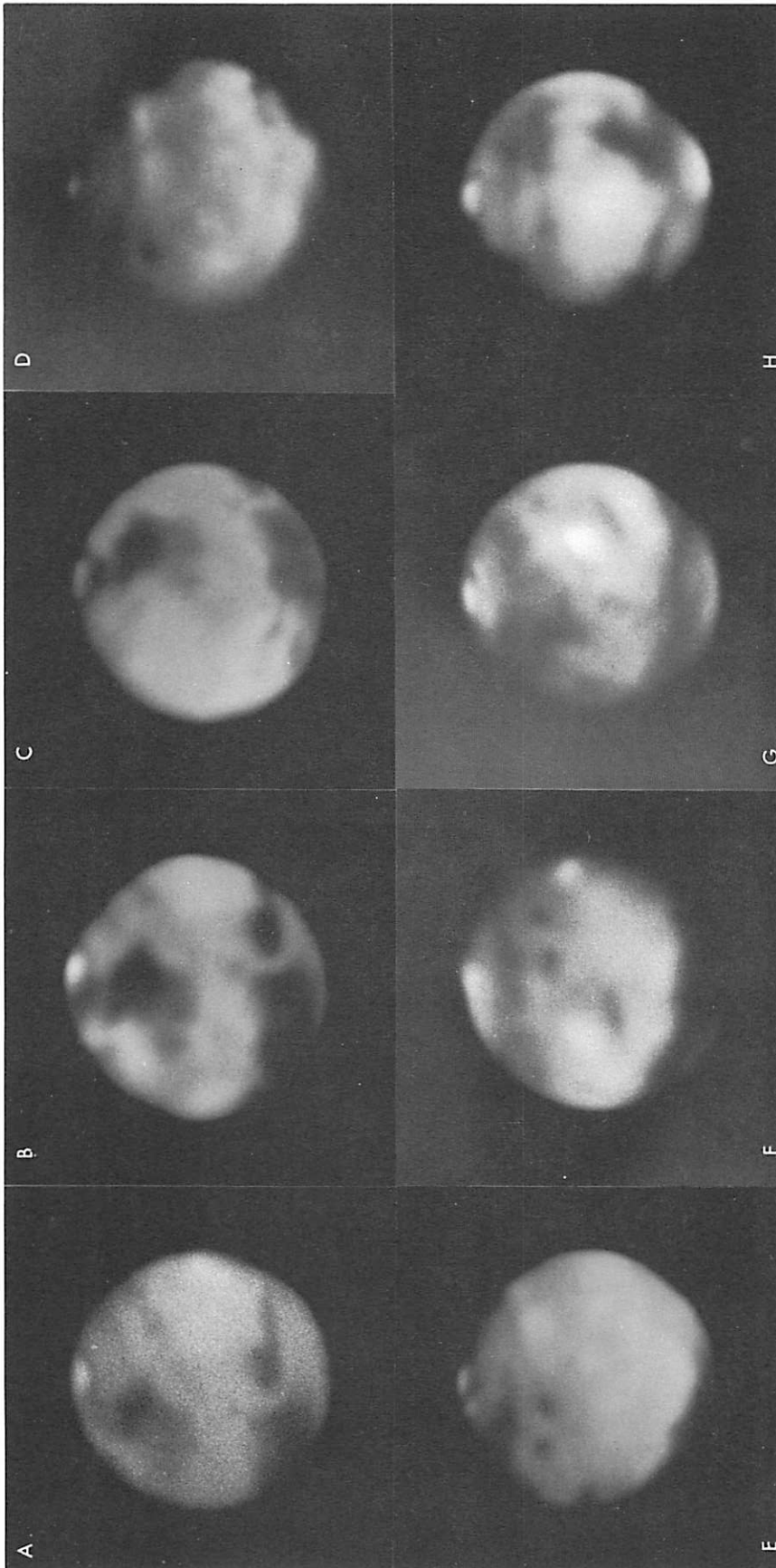


Fig. 1 Representative selection of photographs obtained during the 1967 opposition of Mars.

Date	Time	Long. of C.M.	Date	Time	Long. of C.M.
A) 1967, May 5	3:53.9 UT	8°3	E) 1967, April 26	8:58.8 UT	161°6
B) 1967, May 4	6:34.5 UT	56.5	F) 1967, March 15	9:59.1 UT	186.6
C) 1967, May 4	6:59.2 UT	62.4	G) 1967, May 20	5:43.7 UT	243.0
D) 1967, April 26	8:20.3 UT	152.3	H) 1967, May 15	6:44.4 UT	321.3

taken to keep their contrast uniform.

To achieve accurate positioning, a large grid was drafted with the appropriate tilt of  $22^\circ$ , photographed, and copied at the scale of the Mars prints. The grid was oriented with the aid of several points whose positions have been well established on the ACIC Mars map (MEC-2, 1967) and the North American Aviation, Inc. map "The Planet Mars" (1962). This simple method proved to be usually consistent to within  $2^\circ$  of areographic latitude from image to image. In the polar zone ( $> 70^\circ\text{N}$ ) the accuracy may be less.

A Mercator projection was used for latitudes  $60^\circ\text{N}$  to  $60^\circ\text{S}$  and a polar projection for the north polar region. Because of the planet's orientation, the region from  $40^\circ\text{S}$  to  $90^\circ\text{S}$  could not be reliably mapped.

For Martian nomenclature, reference is made to *Transactions*, International Astronomical Union (1958).

The map was first drawn in pencil at a scale of 1:25,000,000 with emphasis on accurate positioning of markings. Foreshortening effects were minimized

by using only the central parts of the image, up to about  $60^\circ$  from the center. The final map was an airbrush tracing of this version by Mrs. B. Vigil, with special effort made to relate intensities accurately.

The accompanying photographs are representative of the material used.

*Acknowledgments.* I am indebted to Mrs. B. Vigil for her airbrush work on the map and to Mr. J. Fountain for making the data available for this work. This research was supported by NASA NGL03-002-002.

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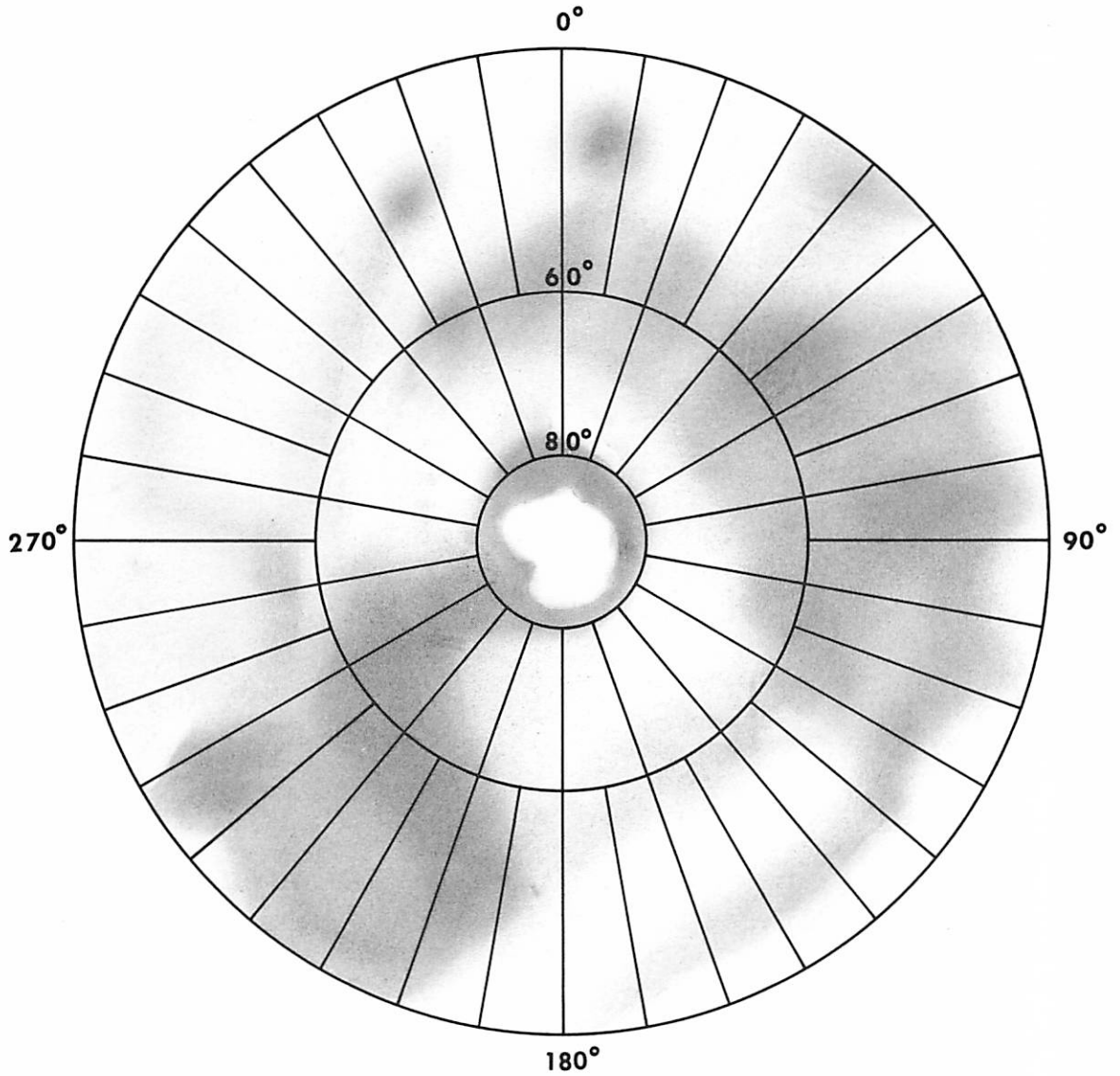


Fig.2 Map of Martian North Polar Region.

#### ERRATUM

Inadvertently the half-tones of Figs. 2 and 3 were rotated 180° in the printing.



Fig. 3 Mars Map. North up.

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