

DEPARTMENT OF THE INTERIOR  
 UNITED STATES GEOLOGICAL SURVEY

**NOTES ON BASE**  
 This is one map in a series of topographic map sheets covering the entire surface of Mars at nominal scales of 1:25,000,000 and 1:5,000,000 (Batson, 1973). The major source of map data was the Mariner 9 television experiment (Matursky and others, 1976).

**ADOPTED FIGURE**  
 The figure of Mars used for the computation of the map projection is an oblate spheroid (flattening of 1/192) with an equatorial radius of 3393.4 km and a polar radius of 3373.7 km.

**PROJECTION**  
 The Lambert conformal conic projection is used for this sheet with standard parallels at 35°S and 55°S. A scale of 1:4,338,000 at lat 30° was chosen to match the scale at lat 30° of the adjacent Mercator projection. Longitude increases to the west in accordance with usage of the International Astronomical Union (IAU, 1971). Latitudes are arcographic (de Vaucouleurs and others, 1973).

**CONTROL**  
 Planimetric control is provided by photogrammetric triangulation using Mariner 9 pictures (Davies, 1973; Davies and Arthur, 1973) and the radio-tracked position of the spacecraft. The first meridian passes through the crater Ary 0 (lat 5.19° S) within the crater Ary. No simple statement is possible for the precision, but local consistency is about 10 km.

**MAPPING TECHNIQUE**  
 A series of mosaics of Lambert conformal conic projections of Mariner 9 pictures was assembled at 1:5,000,000.

Shaded relief was copied from the mosaics and portrayed with uniform illumination with the sun to the west. Many Mariner 9 pictures besides those in the base mosaic were examined to improve the portrayal (Leventhal and others, 1973). The shading is not generalized and may be interpreted with photographic reliability (Inge, 1972).

Shaded relief analysis and representation were made by Jay L. Inge.

**ALBEDO MARKINGS**  
 The markings superimposed on the shaded relief were hand copied from pictures that were computer enhanced especially to show low frequency tone variation (Batson and Inge, 1976). The surface in these pictures is illuminated from a variety of angles from the camera line of sight. The markings therefore delineate boundaries of local brightness variations only and should not be considered as a true measure of albedo. No attempt was made to use Earth-based telescope albedo data.

Airbrush portrayal of albedo markings was done by Jay L. Inge.

**CONTOURS**  
 Since Mars has no seas and hence no sea level, the datum (the 0 km contour line) for altitudes is defined by a gravity field described by spherical harmonics of fourth order and fourth degree (Jordan and Lorel, 1973) combined with a 6-millibar atmospheric pressure surface derived from radio occultation data (Klose and others, 1973; Christensen, 1975). This datum is a triaxial ellipsoid with semi-major axes of A=3394.6 km, B=3393.3 km, and a semi-minor axis of C=3376.3 km. The semi-major axis is in the direction of the Martian surface at long 192°.

The contour lines (Wu, 1975) were compiled from Earth-based radar determinations (Downs and others, 1971; Pettengill and others, 1971) and measurements made by Mariner 9 instrumentation, including the ultraviolet spectrometer (Hend and others, 1974), infrared interferometer spectrometer (Conath and others, 1973), and stereoscopic Mariner 9 television pictures (Dra and others, 1973).

Formal analysis of contour-line accuracy has not been made. The estimated vertical accuracy of each source of data indicates a probable error of 1-2 km.

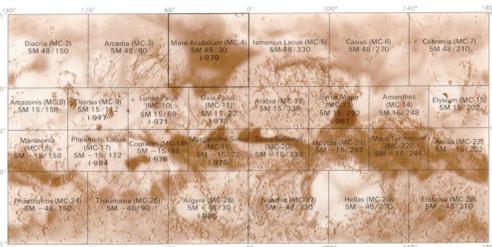
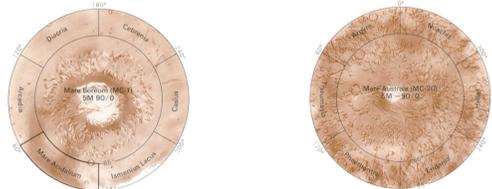
**COLOR**  
 No attempt was made on the map to precisely duplicate the color of the Martian surface, although the color used does approximate it.

**NOMENCLATURE**  
 All names on this sheet are approved by the International Astronomical Union (IAU, 1974; Millman, written comment, 1975), except the following name which is provisional: *Cydonia Mensae*. Double and triple letter designations for craters refer to position on the map. Some craters have commemorative names; letter designations for these craters are shown in parentheses. Where craters lie mostly on an adjoining map, their letters are derived from the other map; where craters lie exactly on the boundary of two maps, their letters are derived from the eastern or southern map.

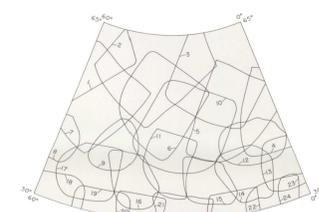
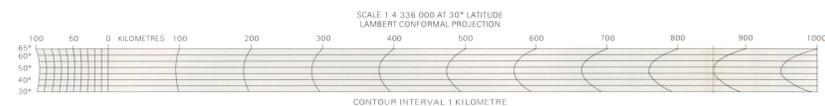
**MC-4**  
 Abbreviation for Mars Chart 4.  
 M 5M 48/30 RMC: Abbreviation for Mars 1:5,000,000 series; center of sheet, 48° N latitude, 30° longitude; shaded relief map, R, with albedo markings, M, and contours, C.

**REFERENCES**

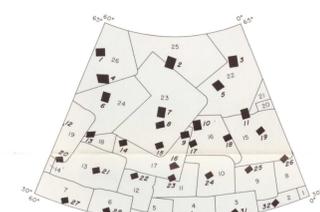
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QUADRANGLE LOCATION  
 Number preceded by 1 refers to published topographic map



| Index No. | DAS No.  | Index No. | DAS No. |
|-----------|----------|-----------|---------|
| 1         | 11879991 | 13        | 8234274 |
| 2         | 12072989 | 14        | 8162468 |
| 3         | 12188797 | 15        | 8080584 |
| 4         | 12262996 | 16        | 8874814 |
| 5         | 12188017 | 17        | 8874824 |
| 6         | 12072989 | 18        | 8874834 |
| 7         | 12072989 | 19        | 8874844 |
| 8         | 8234144  | 20        | 8018064 |
| 9         | 8875084  | 21        | 8080614 |
| 10        | 12188777 | 22        | 8162464 |
| 11        | 11866423 | 23        | 8234274 |
| 12        | 8162624  | 24        | 8080724 |



| A camera pictures |         |           |          | High-resolution B camera pictures |          |           |          |
|-------------------|---------|-----------|----------|-----------------------------------|----------|-----------|----------|
| Index No.         | DAS No. | Index No. | DAS No.  | Index No.                         | DAS No.  | Index No. | DAS No.  |
| 1                 | 8080724 | 14        | 8887864  | 1                                 | 8882414  | 17        | 8818874  |
| 2                 | 8234274 | 15        | 8162468  | 2                                 | 12072989 | 18        | 8162468  |
| 3                 | 8162468 | 16        | 8080724  | 3                                 | 12072989 | 19        | 8162468  |
| 4                 | 8080584 | 17        | 8080584  | 4                                 | 8080584  | 20        | 8080584  |
| 5                 | 8018064 | 18        | 8874814  | 5                                 | 7882508  | 21        | 8874814  |
| 6                 | 8874814 | 19        | 8234144  | 6                                 | 8234144  | 22        | 8234144  |
| 7                 | 8874824 | 20        | 8874824  | 7                                 | 12072989 | 23        | 8874824  |
| 8                 | 8018064 | 21        | 12072989 | 8                                 | 12072989 | 24        | 12072989 |
| 9                 | 8162468 | 22        | 12072989 | 9                                 | 12072989 | 25        | 12072989 |
| 10                | 8162468 | 23        | 12072989 | 10                                | 12072989 | 26        | 12072989 |
| 11                | 8080614 | 24        | 12072989 | 11                                | 12072989 | 27        | 12072989 |
| 12                | 8874814 | 25        | 12072989 | 12                                | 12072989 | 28        | 12072989 |
| 13                | 8874824 | 26        | 11866423 | 13                                | 8874824  | 29        | 8874824  |
|                   |         |           |          | 14                                | 8875084  | 30        | 8875084  |
|                   |         |           |          | 15                                | 8874834  | 31        | 8874834  |
|                   |         |           |          | 16                                | 7882508  | 32        | 8234274  |

**TOPOGRAPHIC MAP OF THE MARE ACIDALIUM QUADRANGLE OF MARS**  
 MC-4  
 M 5M 48/30 RMC  
 1976