

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; 1976). The major source of map data was the Mariner 9 television experiment (Masursky and others, 1970).

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 3375.7 km. This is not the height datum, which is defined below under the heading "Contours."

PROJECTION
The Mercator projection is used for this sheet, with a scale of 1:5,000,000 at the equator and 1:4,336,000 at lat 30°. Longitudes increase to the west in accordance with the usage of the International Astronomical Union (IAU, 1971). Latitudes are areographic (de Vasconcelos 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-O (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 Mercator 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 (Levinthal and others, 1973; Green and others, 1975; Inge and Bridges, 1976). The shading is not generalized and may be interpreted with nearly 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 telescopic 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 Lorell, 1973) combined with a 6.1-millibar atmospheric pressure surface derived from radio-occultation data (Kliore and others, 1973; Christensen, 1975; Wu, 1975).

The contour lines on most of the Mars maps (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 (Hord and others, 1974), infrared interferometer spectrometer (Conrath and others, 1973), and stereoscopic Mariner 9 television pictures (Wu and others, 1973).

Formal analysis of the accuracy of topographic elevation information has not been made. The estimated vertical accuracy of each source of data indicates a probable error 1–2 km.

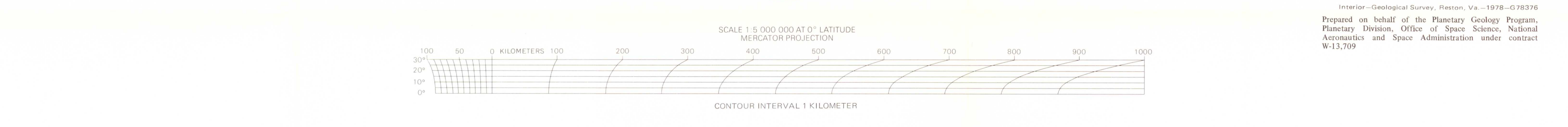
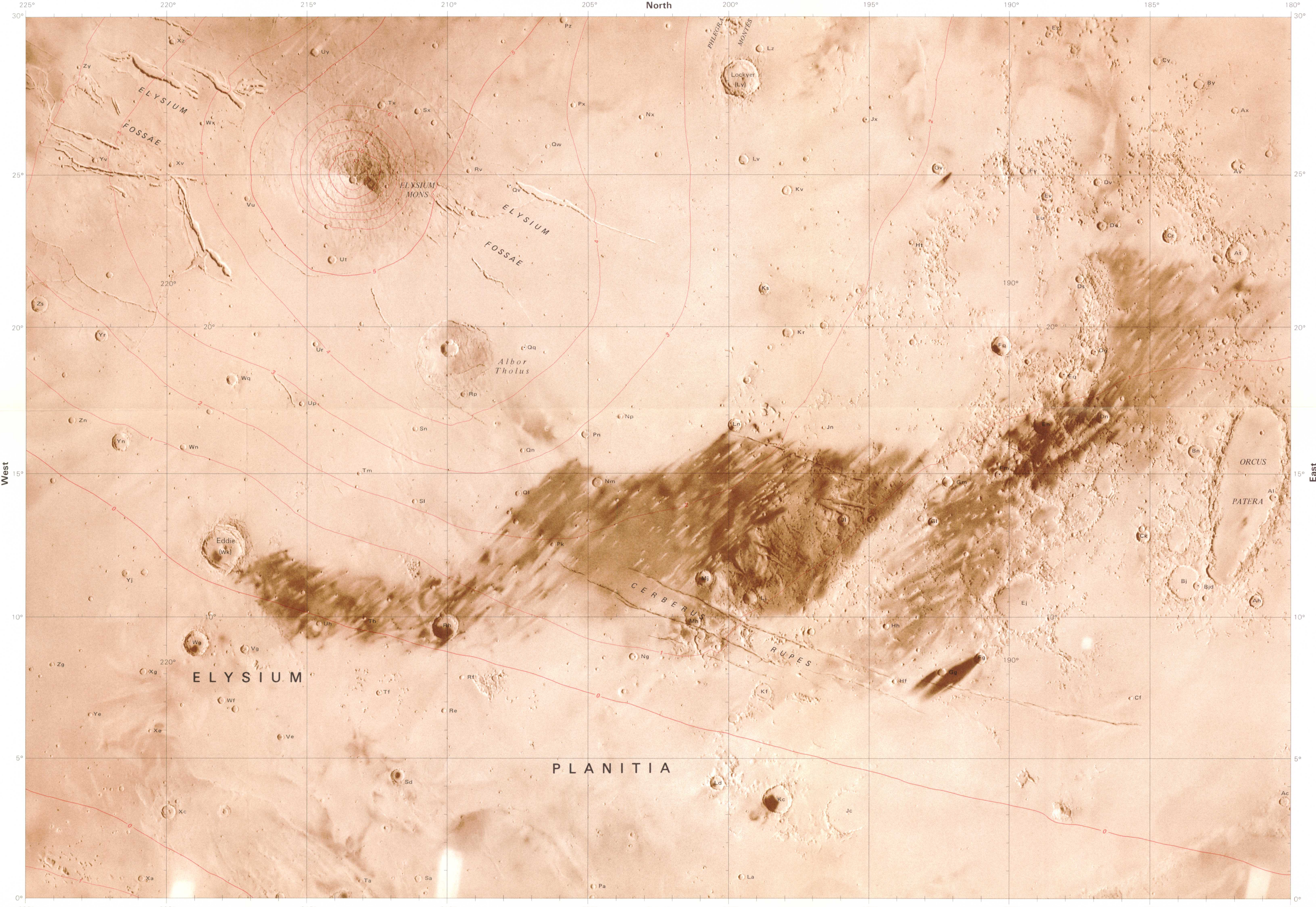
COLOR
No attempt was made on the map to duplicate precisely the color of the Martian surface, although the color used does approximate it.

NOMENCLATURE
All names on this sheet are approved by the International Astronomical Union (IAU, 1974; 1977) except Cerberus Rupes which is proposed. Double and triple letter designations for craters refer to position on the map and are derived from a grid based on equidistant meridians and parallels; the alphabet (I and O omitted) runs in the direction of increasing longitude (W) and latitude (N). The complete designation of a crater is the name of the quadrangle followed by a double or triple letter. The prefix ELY (identifying the Elysium quadrangle) is part of the complete designation but, for brevity, is not shown on most craters. 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.

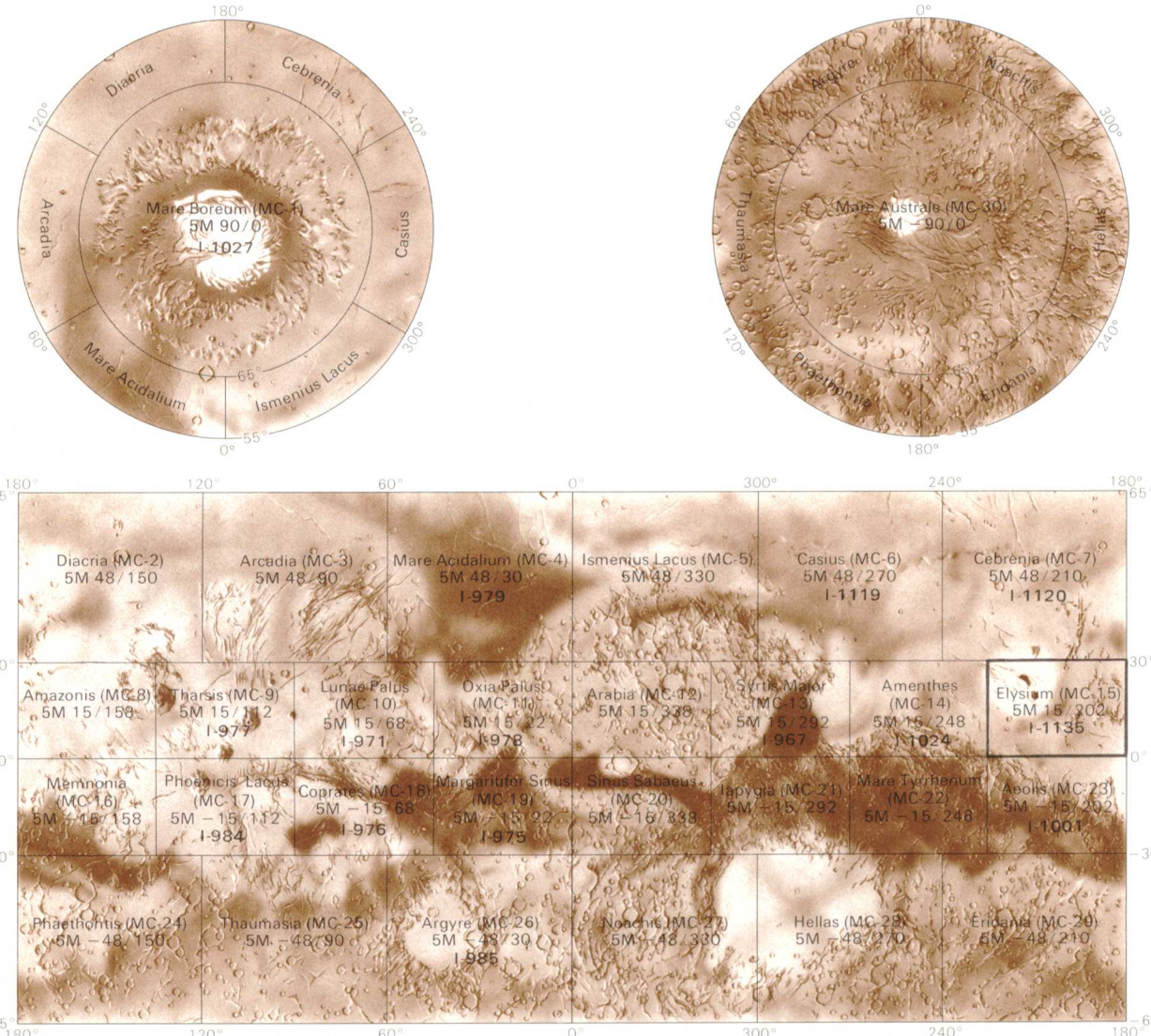
MC-15: Abbreviation for Mars Chart 15.
M 5M 15/202 RMC: Abbreviation for Mars 1:5,000,000 series; center of sheet, lat 15° W., long 202° W., shaded relief map, R, with albedo markings, M, and contours, C.

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W-13,709



ALBEDO MARKINGS FROM INTERNATIONAL PLATE
by Planetary Geology, U.S. Geological Survey, Flagstaff, Ariz.

NOTE TO USERS:
Users noting errors or omissions are urged to indicate them on the map and to forward the map to Astrogeologic Studies, Geologic Division, 2255 North Gemini Drive, Flagstaff, Arizona 86001. A replacement copy will be returned.



INDEX TO MARINER 9 PICTURES USED TO MAKE THE ALBEDO MARKINGS OVERLAY
Most of the pictures indexed above were specially processed to accentuate albedo markings. Only the useful image areas of the pictures are outlined.

Index No.	DAS No.	Index No.	DAS No.
1	7579568	24	7866708
2	8391808	25	7930588
3	9126424	26	7650668
4	9196324	27	7851318
5	9270214	28	7722868
6	7851458	29	7723208
7	6281738	30	7794748
8	7851598	31	7866638
9	7990238	32	7930628
10	7851728	33	7650898
11	7930118	34	7722798
12	7579498	35	7794878
13	7851108	36	7850658
14	7951388	37	7866668
15	7722998	38	7850988
16	7794888	39	7930458
17	7795168	40	7650908
18	7851058	41	7722718
19	7930668	42	7794608
20	7791438	43	7280638
21	7851038	44	7232308
22	7722928	45	7930398
23	7794818	46	6607338



INDEX TO MARINER 9 PICTURES
The mosaic used to control the positioning of features on this map was made with the Mariner 9 A-camera pictures outlined above, identified by vertical numbers. Also shown (by solid black rectangles) are the high-resolution B-camera pictures, identified by italic numbers. Useful coverage is not available in cross-hatched areas. The DAS numbers may differ slightly (usually by 5) among various versions of the same picture.

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	7579568	26	7744743	1	7579568	17	7722868
2	7579513	27	7744673	2	8391808	18	7722818
3	7579458	28	7744603	3	9126424	19	7722768
4	7579403	29	7795008	4	9196324	20	7795158
5	8082848	30	9270208	5	9270214	21	7795058
6	9054539	31	7851723	6	9054539	22	7794848
7	7851653	32	7866713	7	7851653	23	7794798
8	7851103	33	7866703	8	7851103	24	7794748
9	7851053	34	7866693	9	7851053	25	7794698
10	7850903	35	7866683	10	7850903	26	7794648
11	7850853	36	7866673	11	7850853	27	7794598
12	7850803	37	7866663	12	7850803	28	7794548
13	7851313	38	8321104	13	7851313	29	8321054
14	9126329	39	7930113	14	9126329	30	8321004
15	7722949	40	7930603	15	7722949	31	8320954
16	7722999	41	7930553	16	7722999	32	8320904
17	7722929	42	7930503	17	7722929	33	8320854
18	7722879	43	7930453	18	7722879	34	8320804
19	7722789	44	7930403	19	7722789	35	8320754
20	7722739	45	7930353	20	7722739	36	8320704
21	7722689	46	7930303	21	7722689	37	8320654
22	9196319	47	6607318	22	9196319	38	8320604
23	7795233	48	5704753	23	7795233	39	8320554
24	7794683	49	7651993	24	7794683	40	8320504
25	7794613	49	7651993				

TOPOGRAPHIC MAP OF THE ELYSIUM QUADRANGLE OF MARS
MC-15
M 5M 15/202 RMC
1978