

## Lunar Map (LM Series) (Published by DMAAC)

### Lunar Maps

Scale: 1:1,000,000

Projection: Mercator and Lambert Conformal Conic

Sheet Size: 25" x 25" and 29"x 22"

The 1:1,000,000 scale Lunar Map (LM) Series is designed to provide topographic coverage of the entire lunar surface. It is the successor to the Lunar Astronautical Chart (LAC) Series and closely follows that series in format and design. However, lunar orbital photography and derivative mapping and selenodetic works are being used extensively in the LM Series, resulting in greatly improved definition of topographic detail and positioning of features.

Individual LM sheets have the same identifying numbers and areas of coverage as LACs. Use of the Mercator projection in equatorial sheets and the Lambert Conformal Conic in middle and higher latitudes is also followed and the specific latitudes limits and standard parallels listed for the LAC Series are also applicable to this Series. Additionally, the 1:1,000,000 scale Lunar Map Series does provide for the Polar Coverage through use of the Polar Stereographic Projection between 80° – 90° north and south latitudes.<sup>1</sup>

The LM maps portray lunar topography by shadient relief in green as viewed with an eastern illumination. Spot elevations, crater depths and basic 300-meter contour interval with 100-meter supplementary contours in relatively level areas are also employed to provide relief information. Form lines are sometimes used to depict topographic features where sources data is inadequate for contour portrayal. Background coloration is also used to indicate crater ray systems and variance of reflectance of lunar areas under full illumination. The shadient relief rendition also appears on map reverse in black and white unencumbered by other map detail.<sup>2</sup>

Chart margin information includes a sheet location index and explanation statement on control used, elevation information contained, features nomenclature and map reliability.

As indicated by areas of varying accuracy within Map Reliability Diagrams, compilation of the Series requires employment of a variety of source materials. For areas in which they are available, 1:250,000 scale Topophotomaps are being used for both horizontal positioning of features and contour information. In other areas of Apollo mapping photography coverage, original compilations by photogrammetric stereo plotter are being accomplished. Other LM areas covered only by Lunar Orbiter Mission photographs and earthbased telescopic photographs reflect the inadequacies of these sources for compilations by

approximate contours, form lines and relative heights and depths (determined by measurement of shadow images) shown.

The Apollo 15 (Apollo 1973) Control System is being used for primary control of this Series, supplemented by earthbased telescopic control and the Positional Reference System (1974) in some farside regions.

At the time of this writing only the below listed two sheets of the LM Series have been published with stated (90% probability) horizontal accuracies of 545-820 meters and 40-450 meter vertical accuracies with respect to the Apollo 15 and DMAAC 1977 Selenodetic System Datums. Actually the DMAAC 1977 System is an earth-based Telescopic System still under development and preliminary values from this work have been adjusted to the Apollo 15 Datum to support compilation of the LM sheets.

Map No	Name	Latitude	Longitude	Edition and Date
LM38	Seleuccus	24	60W	1 <sup>st</sup> Edition, Nov 1979
LM39	Aristarchus	24	40W	1 <sup>st</sup> Edition, Nov 1979
LM 41	Montes Apenninus	24	0	1 <sup>st</sup> Edition, Dec 1976
LM42	Mares Serenitatis	24	20E	1 <sup>st</sup> Edition, Nov 1976
LM60	Julius Caesar	8	20E	1 <sup>st</sup> Edition, Sep 1978
LM62	Mare Undarum	8	20W	1 <sup>st</sup> Edition, Sep 1978
LM76	Montes Rhipaeus	-8	60E	1 <sup>st</sup> Edition, Oct 1979
LM77	Ptolemaeus	-8	0	1 <sup>st</sup> Edition, Sep 1978
LM78	Theophilus	-8	20E	1 <sup>st</sup> Edition, Sep 1978
LM103	O'Day	-24	160E	1 <sup>st</sup> Edition, Sep 1978
LM104	Van de Graaff	-24	180	1 <sup>st</sup> Edition, Sep 1978

<sup>1</sup> Series was suspended with only 11 maps completed. Polar maps were not prepared.

<sup>2</sup> Shadient relief rendition only available on LM41 and LM42.

Title: The Lunar Cartographic Dossier

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