

TLP Coordinates

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We noted in ‘Revisiting The 1963 Aristarchus Events’¹ James Greenacre used the Orthographic Atlas of the Moon to determine coordinates for the reddish transient lunar phenomena (TLP) seen on October 30 and November 28 1963 (UT). In this supplement we present some additional background material. This supplement available for download at: www.the1963aristarchusevents.com

Sheet E3-a, ‘Euler’

James Greenacre determined the coordinates of the TLP seen in October and November 1963 using the *Orthographic Atlas of the Moon. Supplement no. 1- Edition B (limb area) sheet E3-a “Euler”*² (See Figure 1).



Figure 1. Sheet E3-a “Euler”. Image: Map and Imagery Collection, Marston Science Library, University of Florida, Gainesville.

In Figures 2 and 3 we have plotted the TLP using Greenacre’s reported orthographic coordinates on cropped and reoriented (IAU) portions of the E3-a “Euler” sheet. The TLP identification labels are those used in our paper. Figures 4 and 5 are examples of side-by-side image comparisons used in determining the equivalent selenographic coordinates as listed in Table 1 of our paper and shown below.

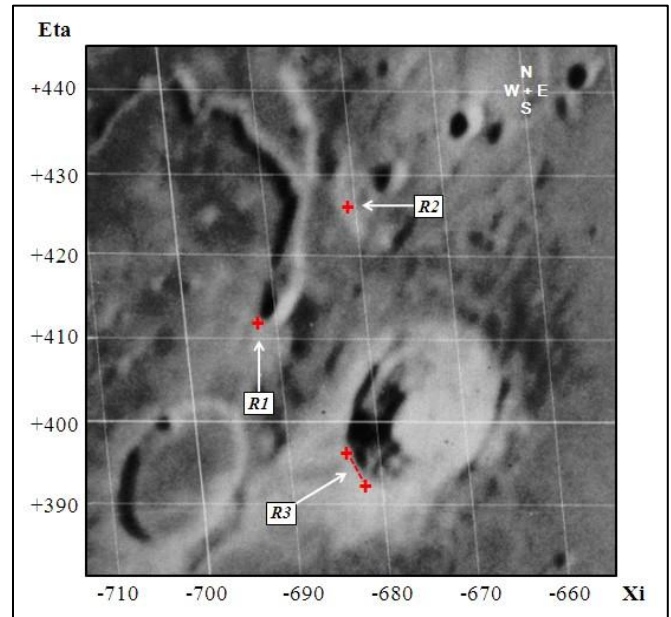


Figure 2. October 30, 1963 (UT) reddish TLP plotted by authors on portion of sheet E3-a, “Euler”. IAU directions.

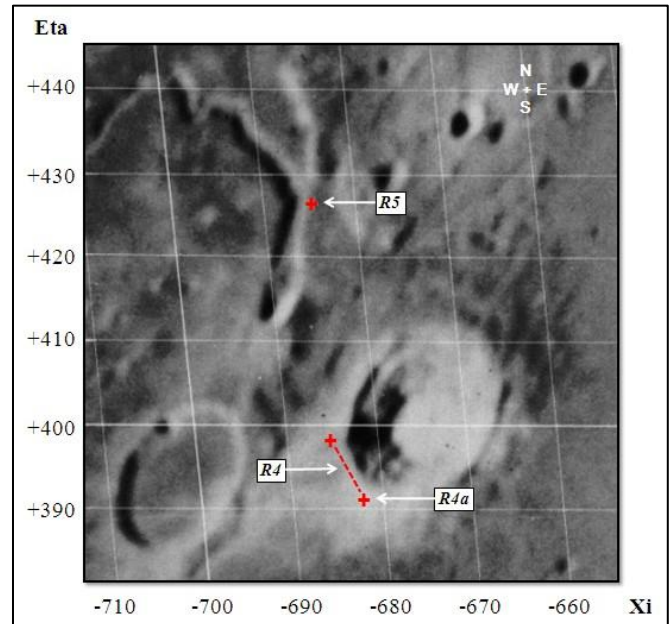


Figure 3. November 28, 1963 (UT) TLP plotted on sheet E3-a, “Euler” in the same manner as was carried out in Figure 2.

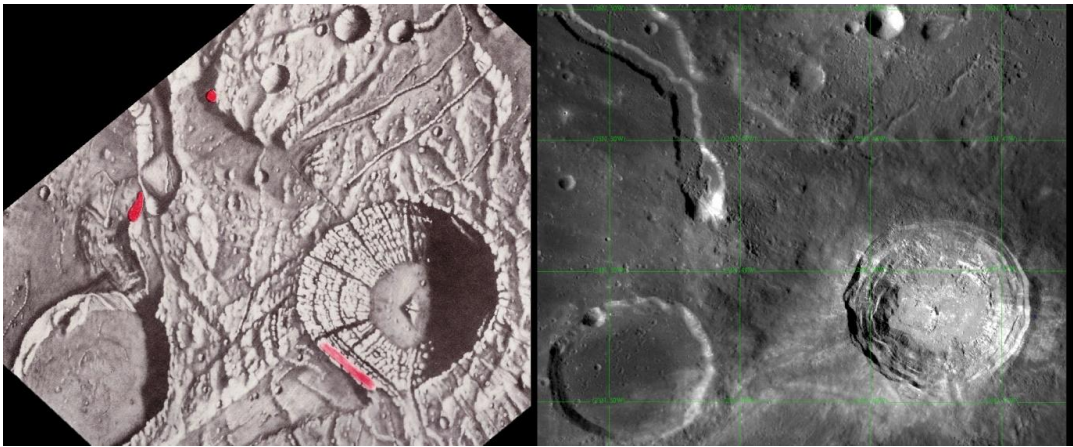


Figure 4. Image comparison used to determine Oct. 30th TLP selenographic coordinates listed in Table 1. Image comparison by Anthony Cook. (left) Rendering of Oct. 30th TLP by Patricia Bridges. (right) LROC Target Acquisition Tool image.

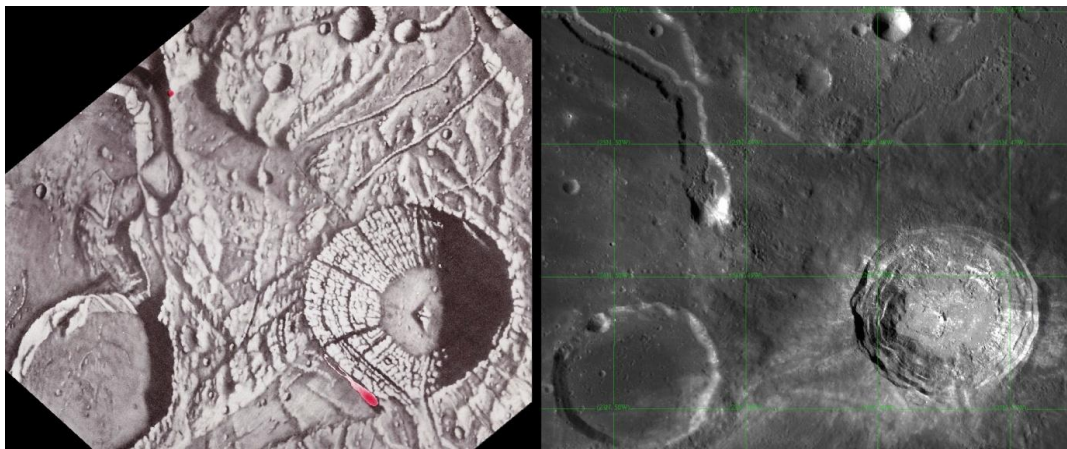


Figure 5. Image comparison for Nov. 28th TLP carried out in same manner as was done in Figure 4.

Date and UT	TLP	Reported Coordinates	Orthographic	Equivalent Selenographic Coordinates
Oct 30 UT 01:50-02:05	R1 - centre	Xi = -0.692, Eta = +0.412		49.5°W, 24.4°N
Oct 30 UT 01:50-02:05	R2 - centre	Xi = -0.681, Eta = +0.426		49.0°W, 25.3°N
Oct 30 UT 01:55-02:05	R3 - south	Xi = -0.682, Eta = +0.392		47.8°W, 23.1°N
“ - “	R3 - centre	Xi = -0.683, Eta = +0.394		47.9°W, 23.3°N
“ - “	R3 - north	Xi = -0.684, Eta = +0.396		48.0°W, 23.5°N
Nov 28 UT 00:45-01:45	R4 - south	Xi = -0.682, Eta = +0.391		47.8°W, 23.1°N
Nov 28 UT 00:30-01:45	R4 - north	Xi = -0.685, Eta = +0.398		48.0°W, 23.2°N
Nov 28 UT 00:45-01:45	R4a	Xi = -0.682, Eta = +0.391		47.6°W, 23.0°N
Nov 28 UT 01:09-01:15	R5	Xi = -0.685, Eta = +0.427 (est. LRO PDS Archive Interface)		49.3°W, 25.3°N

Table 1. Positional information on the reddish TLP seen on 1963 Oct 30 and 1963 Nov 28. The original orthographic coordinates were reported to three decimal places, or about 1.7km precision on the lunar surface. The longitudes and latitudes that we give were found by comparing the illustrated maps by Patricia Bridges (Figures 6 and 10) with the LROC Target Acquisition Tool and have a precision of 0.1° or approximately 3km, because it is difficult to compare the LAC chart visually with the base maps used on the LROC website due to differences in illumination angle.

Table 1 from ‘Revisiting The 1963 Aristarchus Events’, page 203.

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References

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- 1 O’Connell, R. & Cook, A., ‘Revisiting The 1963 Aristarchus Events’, *J. Brit. Astron. Assoc.*, **123**(4) pp. 197-208, (2013 August)
 - 2 Arthur D & Whitaker E, 1961, *Orthographic atlas of the Moon. Supplement no. 1- Edition B (limb area)*. *Xi* (ξ) and *Eta* (η) are rectangular lunar coordinates with their origin at the mean apparent center of the lunar disk and given in units of $1/100^{\text{th}}$ of the lunar radius. *Xi* is positive to IAU lunar east (the direction of Mare Crisium) and negative to the west; *Eta* is positive to IAU north and negative to the south. For additional information see: <http://the-moon.wikispaces.com/Orthographic+Atlas+of+the+Moon> (Accessed 2013-08-19).