Observation of a grazing star occultation in daylight

ESOP XXXVI

Freiberg

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www.dangl.at

Diagram of occultation area in northern hemisphere on May 08, 2016

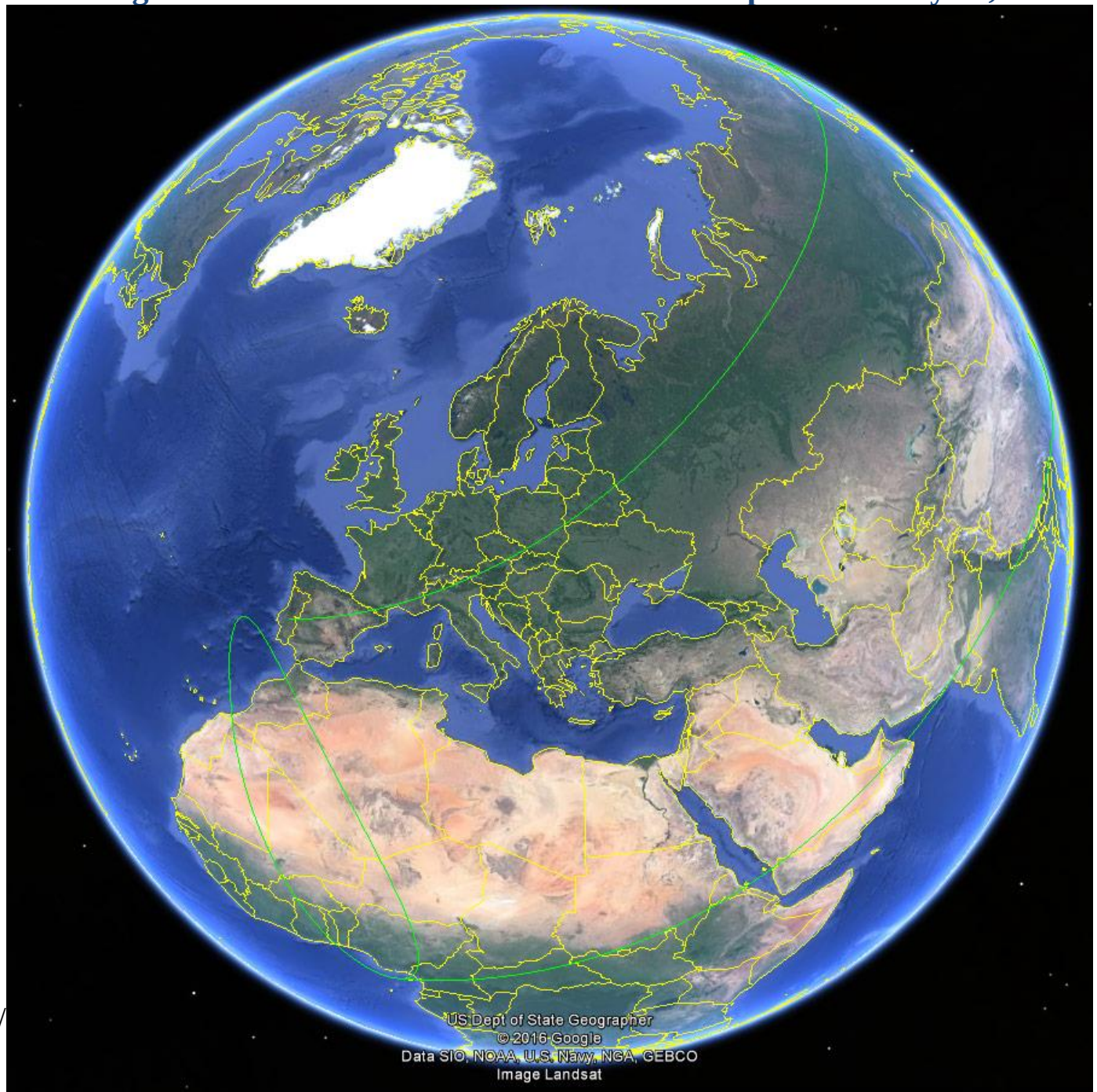
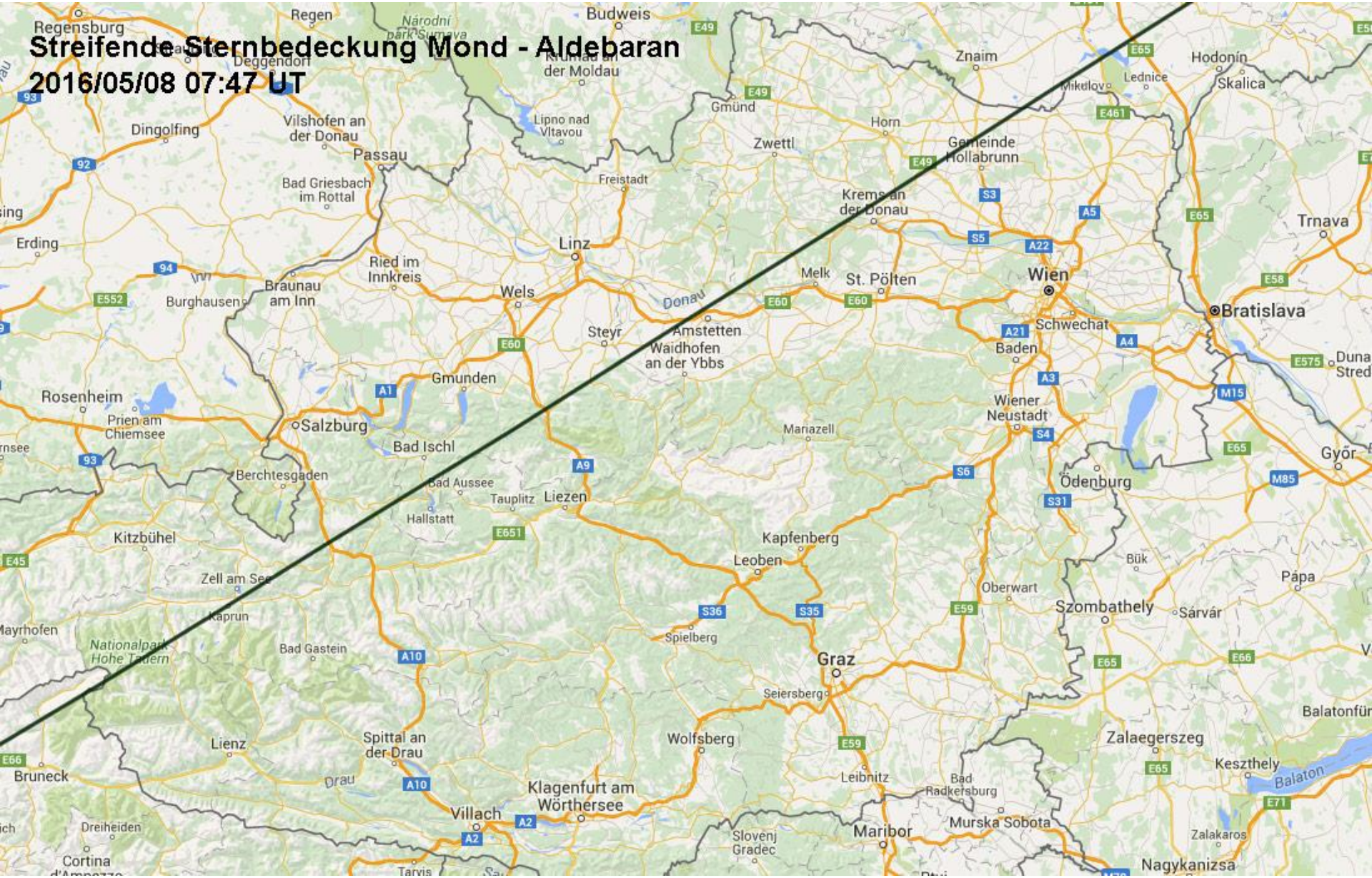
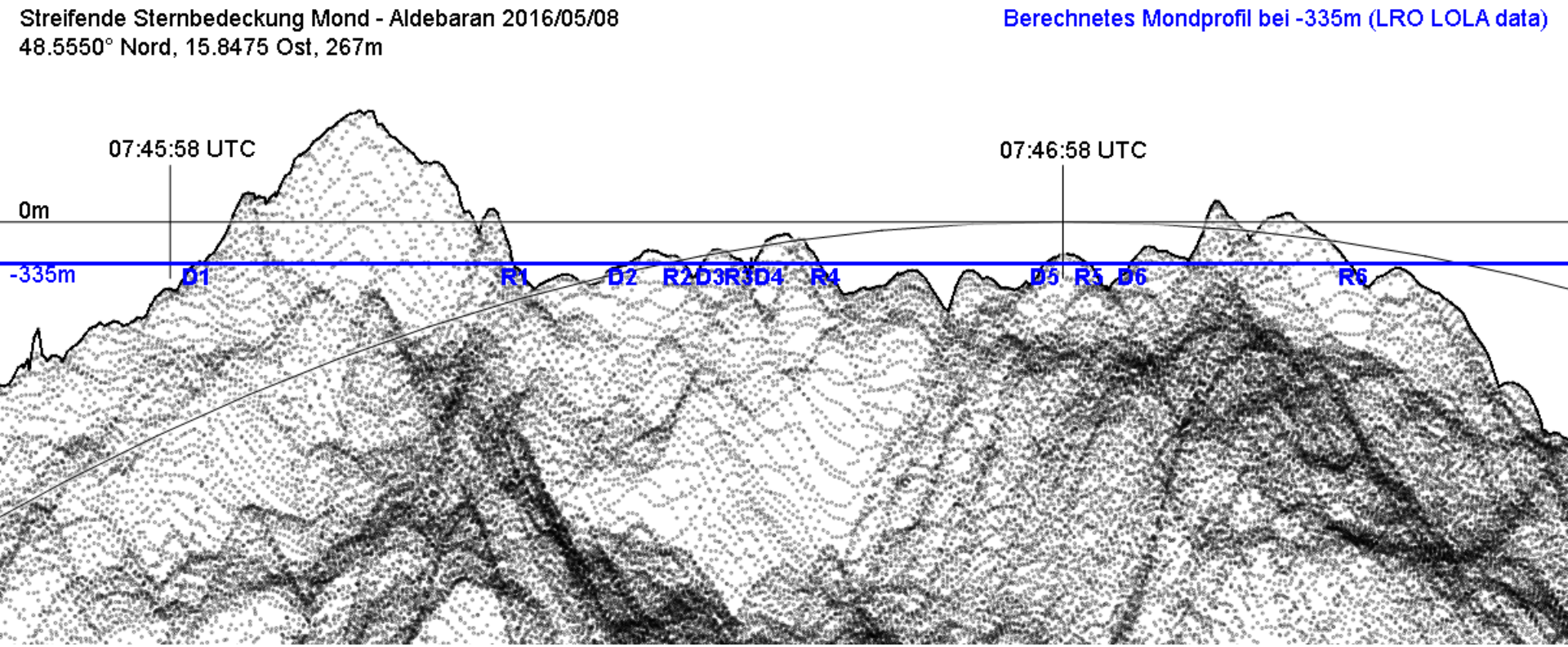


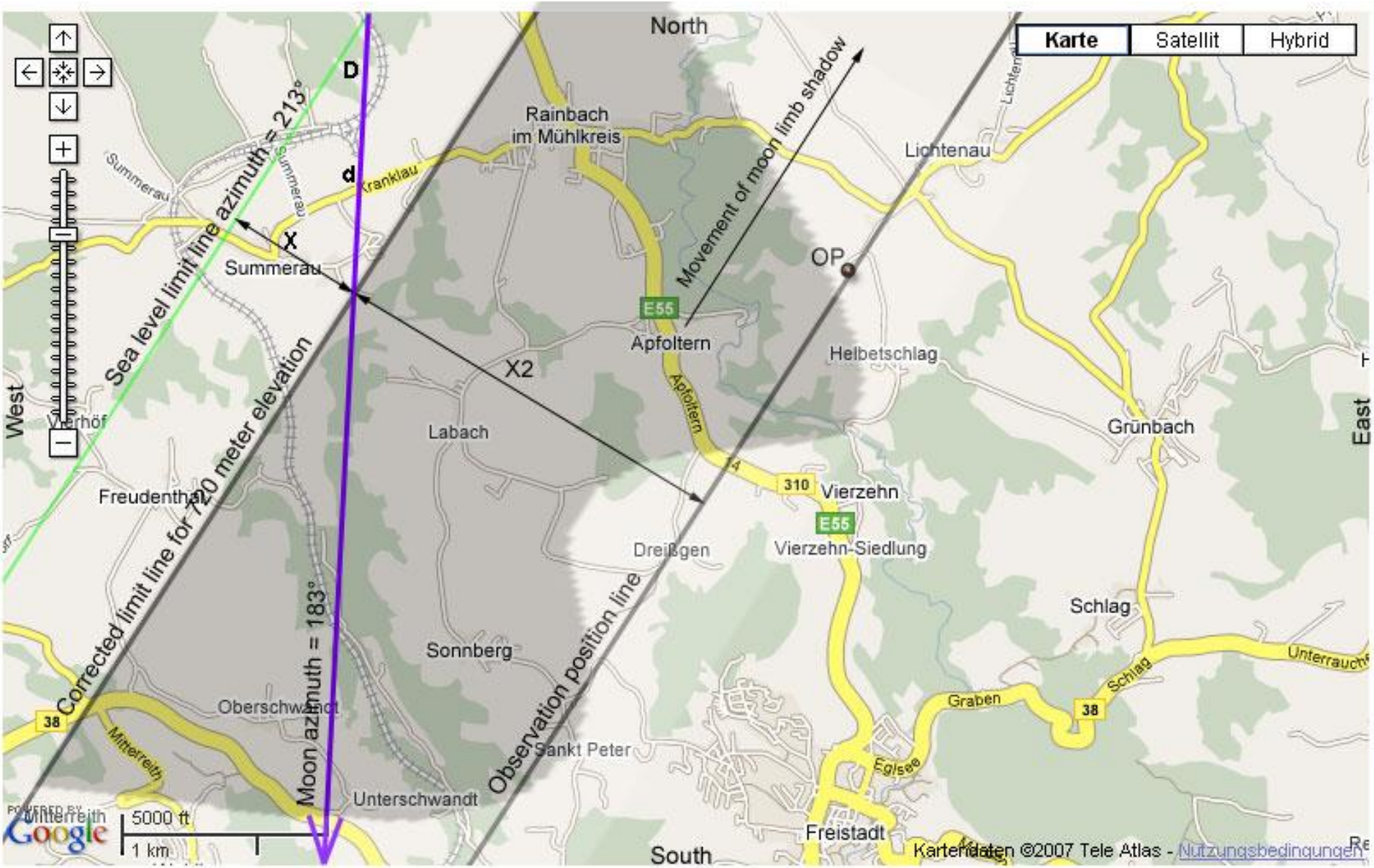
Diagram of occultation area in Austria on May 08, 2016



The lunar edge profile also determines the calculation and selection of a suitable observation site



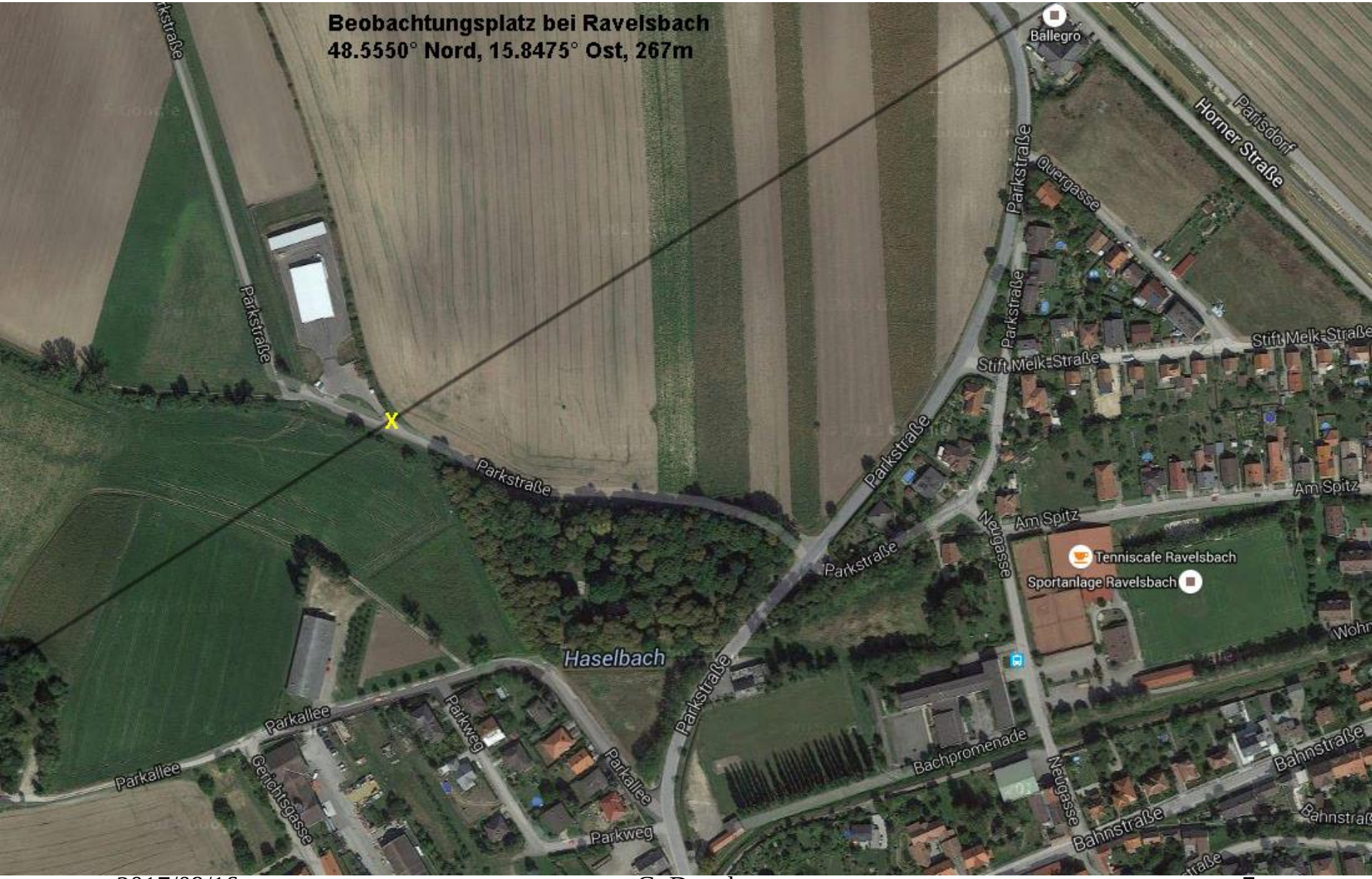
The way to calculate the final path shift



Accurate calculation and selection of a suitable observation site

Graze calculation	Date: 2016-05-08 Time: 07:46:58 UTC		Star:		ZC692 (Aldebaran), +0.9mag		
TanZ at Longitude of OP	2.11		OP shift x2 due to moon profile	335	meters	OP shift against MSL of 0 meters	
Moon Azimut at Longitude of OP	93	deg	Mid height of observation point	265	meters	d (height)	x (height)	x+x2 (+profil)
Path on map X1	0	pixel	Steps for height variations	2	meters	[meters]	[meters]	[meters]
Path on map Y1	576	pixel	OP height MSL	247	meters	521	301	636
Path on map X2	913	pixel	OP height MSL	249	meters	525	303	638
Path on map Y2	0	pixel	OP height MSL	251	meters	530	306	641
Path on map delta X	913	pixel	OP height MSL	253	meters	534	308	643
Path on map delta Y	-576	pixel	OP height MSL	255	meters	538	311	646
Path angle to East_West direction	-32.2	deg	OP height MSL	257	meters	542	313	648
Path Azimut	237.8	deg	OP height MSL	259	meters	546	315	650
Moon Azimut - path delta angle	144.8	deg	OP height MSL	261	meters	551	318	653
Sinus of Azimuth - path delta angle	0.58		OP height MSL	263	meters	555	320	655
Height factor TanZ * Sinus Azimuth	1.22		OP mid height MSL	265	meters	559	323	658
Moon Altitude at OP from TanZ	25.4	deg	OP height MSL	267	meters	563	325	660
Distance for object with height of 01 m	2	meters	OP height MSL	269	meters	568	328	663
Distance for object with height of 02 m	4	meters	OP height MSL	271	meters	572	330	665
Distance for object with height of 03 m	6	meters	OP height MSL	273	meters	576	332	667
Distance for object with height of 04 m	8	meters	OP height MSL	275	meters	580	335	670
Distance for object with height of 05 m	11	meters	OP height MSL	277	meters	584	337	672
Distance for object with height of 10 m	21	meters	OP height MSL	279	meters	589	340	675
Distance for object with height of 15 m	32	meters	OP height MSL	281	meters	593	342	677
Distance for object with height of 20 m	42	meters	OP height MSL	283	meters	597	345	680
Distance for object with height of 25 m	53	meters	Real OP height MSL	267	meters	Moon profile position on real OP		
Distance for object with height of 30 m	63	meters	Real OP distance to zero line	660	meters		335	meters
Located observation point (OP)	Austria		Ravelsbach, 3720			15.8475 E	48.5550 N	267

The choice of the location in Ravelsbach resulted in the shortest possible arrival time and ideal observation conditions on site



The observation place in front of the waste collection center in Ravelsbach

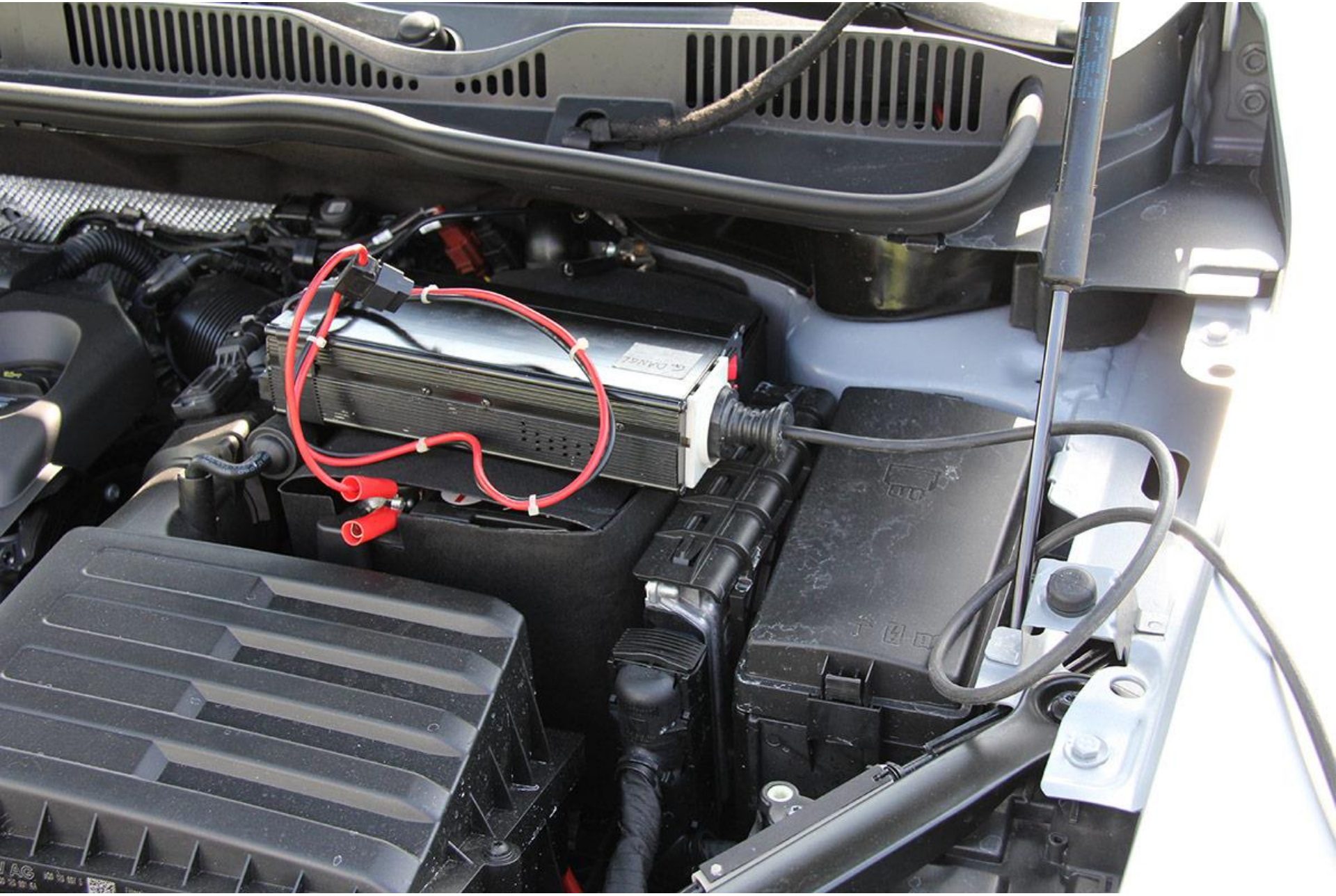
Mount EQ6 is capable to carry and move the newton in such observations with sufficient accuracy

The technical expenditure required for such an observation is large

The observation site is close to the outskirts of Ravelsbach

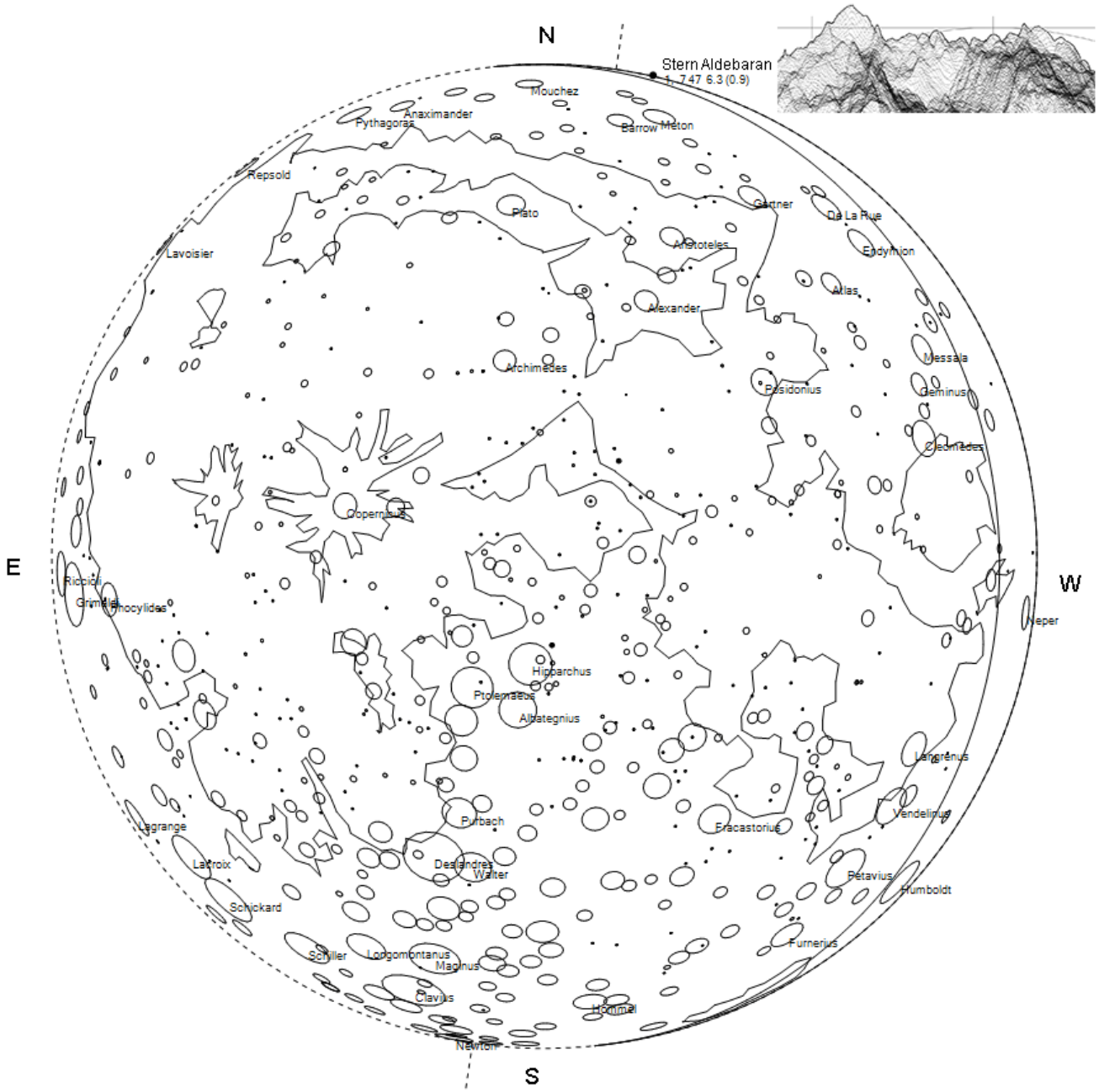
At the southeast sky, in the direction of the moon, more and more cloud structures developed

For mobile observations, a DC / AC converter ensures the problem-free 230V supply from the car battery

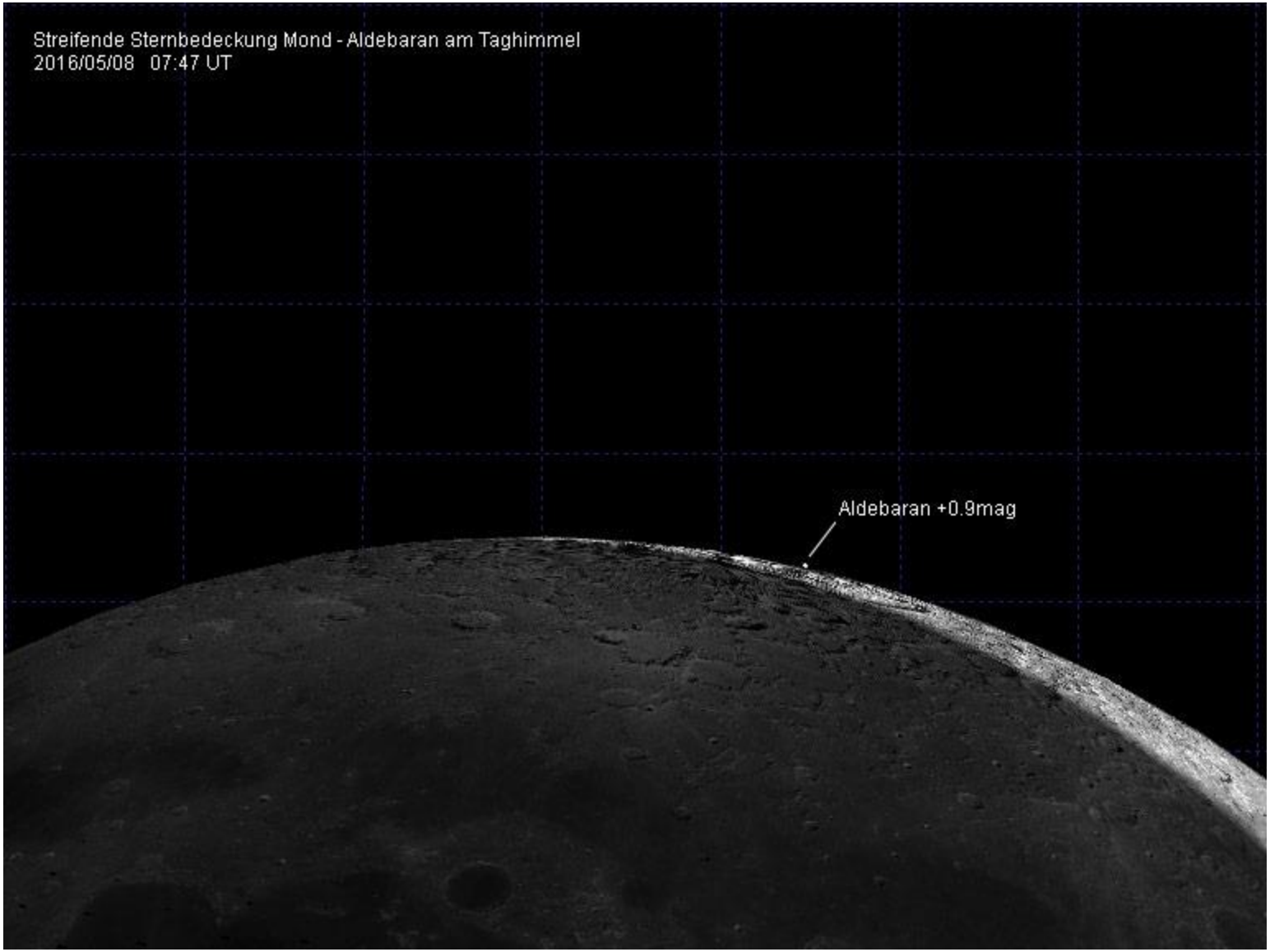


After the grazing star occultation, the clouds in the southern sky became even denser

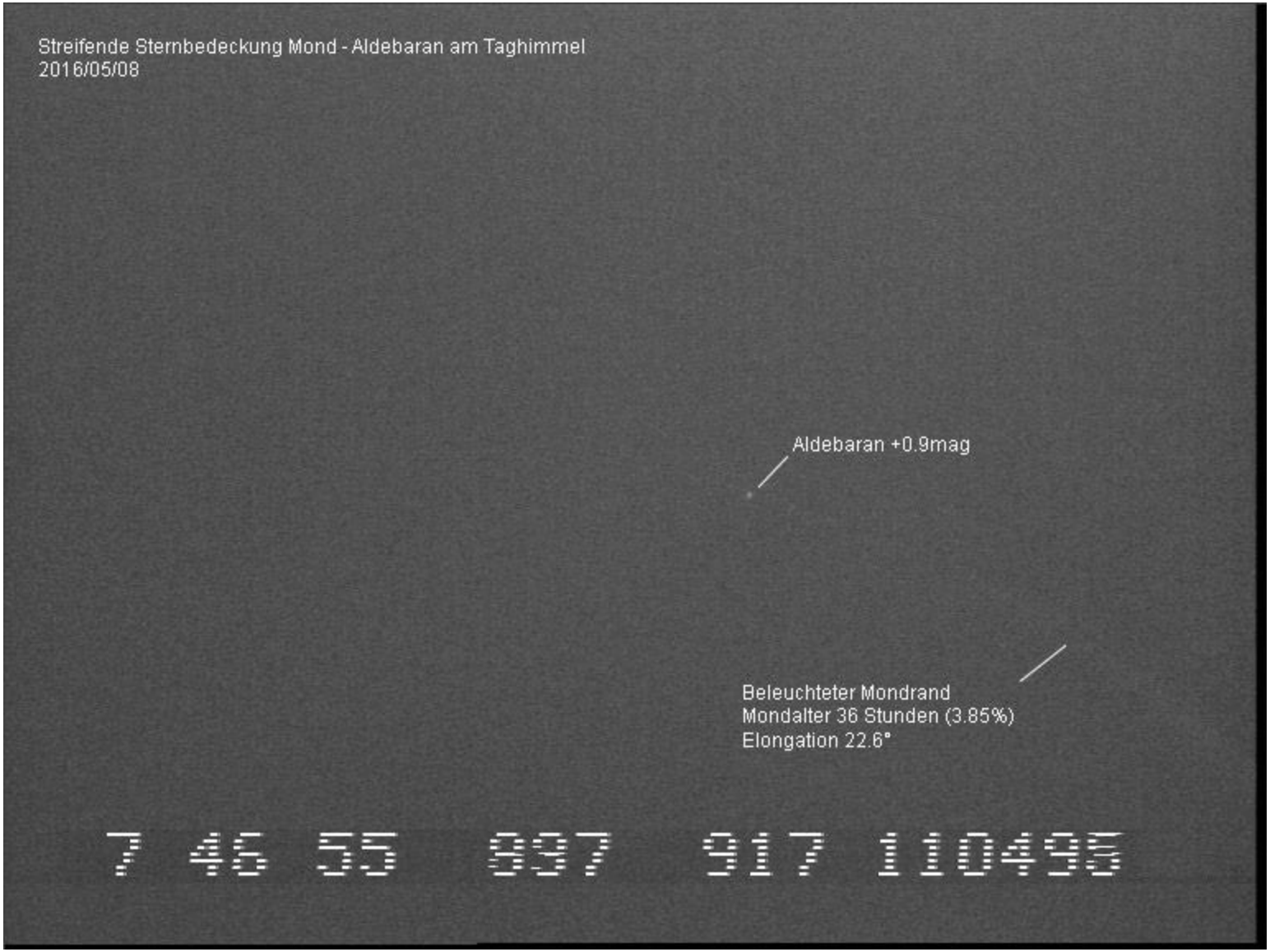
This map from the moon shows where the grazing star occultation takes place



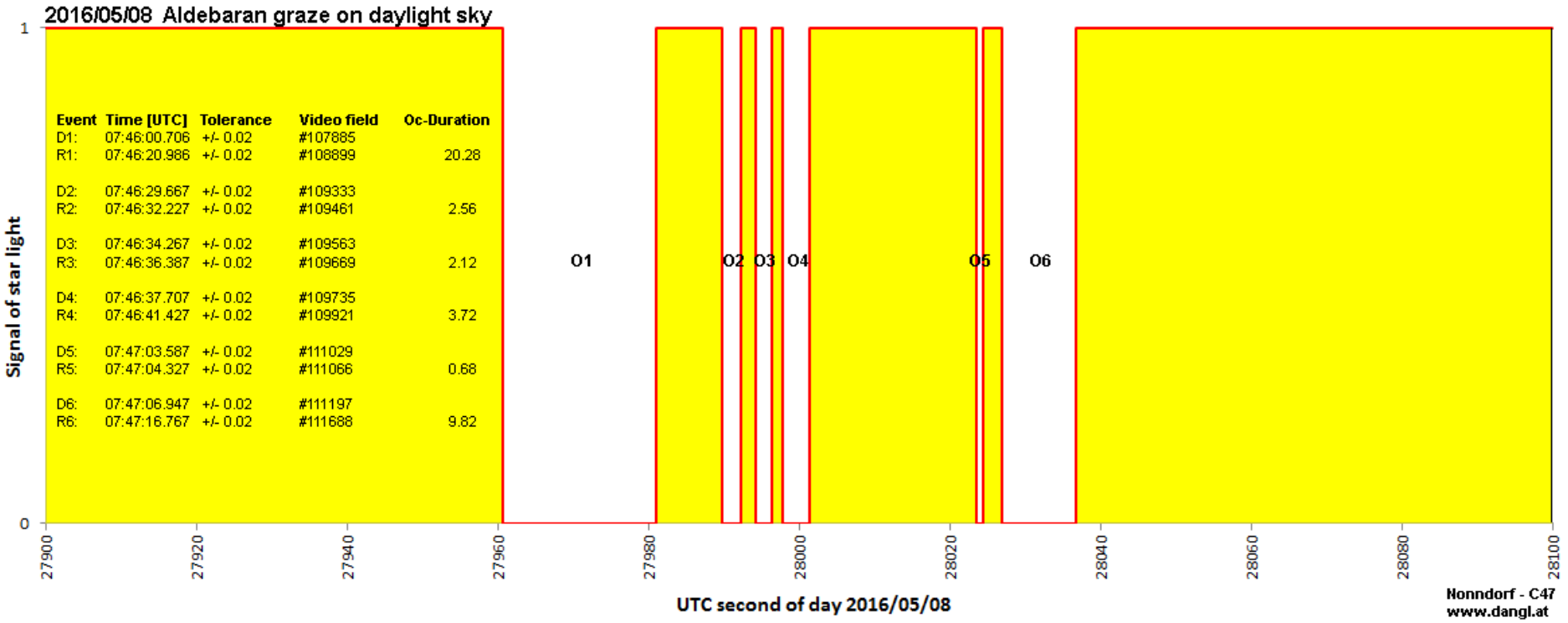
A presentation from the program Guide 9



Real video image after strong contrast enhancement on the computer



The six recorded occcultation events as a digital time diagram




7 46 01 896 716 107785


Daylight graze of star Aldebaran by the Earthmoon 2016/05/08
D2/R2 D3/R3 D4/R4
7:46:30 897 717 109235
Video times with +3s offset to UTC
www.dangl.at

Daylight graze of star Aldebaran by the Earthmoon 2016/05/08 D5/R5 D6/R6

Video times with +3s offset to UTC www.dangl.at

Data reduction file created with Occult4

File name : 2016_05_08_dangl_graze.dat
Reduction date : Montag, 27. Juni 2016
Ephemeris : DE430,422 (1600/2250), DE422 (-2999/3000)
Limb basis : LRO Lunar Orbiter Laser Altimeter [LOLA]
O-C basis : limb correction applied

Telescopes:

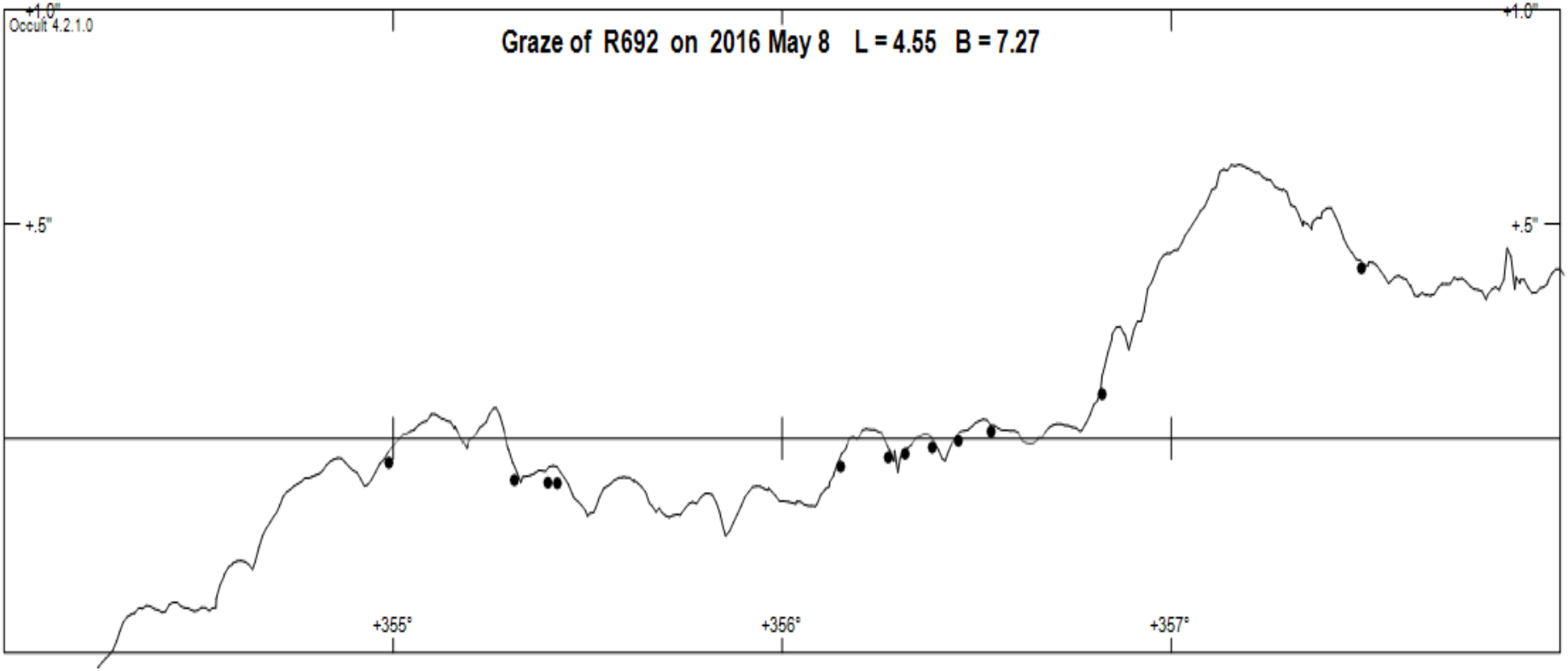
	Aperture	Longitude	Latitude	Alt
#	cm	o ' "	o ' "	m
A	25	+ 15 50 51.1	+48 33 17.9	268

ref	Tel	Observer	Star No.	y	m	d	h	m	s	PhGrMrCeDb	O-C	limb	PA	l	b	AA	P	D	scale
001	A	Gerhard Dangl	R 692	2016	5	8	7	46	0.71	DB G G 1	-0.02	0.44	349.13	4.55	7.27	357.49	358.04	-7.20	1.070
002	A	Gerhard Dangl	R 692	2016	5	8	7	46	20.99	RB G G 1	-0.04	0.15	348.47	4.55	7.27	356.82	357.36	-7.25	1.070
003	A	Gerhard Dangl	R 692	2016	5	8	7	46	29.67	DB G G 1	-0.01	0.03	348.18	4.55	7.27	356.54	357.08	-7.27	1.070
004	A	Gerhard Dangl	R 692	2016	5	8	7	46	32.23	RB G G 1	-0.01	0.00	348.10	4.55	7.27	356.45	356.99	-7.28	1.070
005	A	Gerhard Dangl	R 692	2016	5	8	7	46	34.27	DB G G 1	-0.03	0.00	348.03	4.55	7.27	356.39	356.93	-7.28	1.070
006	A	Gerhard Dangl	R 692	2016	5	8	7	46	36.39	RB G G 1	-0.01	-0.03	347.96	4.55	7.27	356.32	356.86	-7.29	1.070
007	A	Gerhard Dangl	R 692	2016	5	8	7	46	37.71	DB G G 1	-0.04	-0.01	347.92	4.55	7.27	356.27	356.81	-7.29	1.070
008	A	Gerhard Dangl	R 692	2016	5	8	7	46	41.43	RB G G 1	-0.01	-0.06	347.80	4.55	7.27	356.15	356.69	-7.30	1.070
009	A	Gerhard Dangl	R 692	2016	5	8	*7 47*	*3.59*		DB G G 1	-0.05	-0.06	347.07	4.55	7.27	355.42	355.96	-7.35	1.070
010	A	Gerhard Dangl	R 692	2016	5	8	7	47	4.33	RB G G 1	-0.04	-0.07	347.05	4.55	7.27	355.40	355.93	-7.35	1.070
011	A	Gerhard Dangl	R 692	2016	5	8	7	47	6.95	DB G G 1	-0.05	-0.06	346.96	4.55	7.27	355.31	355.85	-7.36	1.070
012	A	Gerhard Dangl	R 692	2016	5	8	7	47	16.77	RB G G 1	-0.03	-0.03	346.64	4.55	7.27	354.99	355.52	-7.38	1.070

Mean residual of events involving single stars: -0.03" ±0.01"

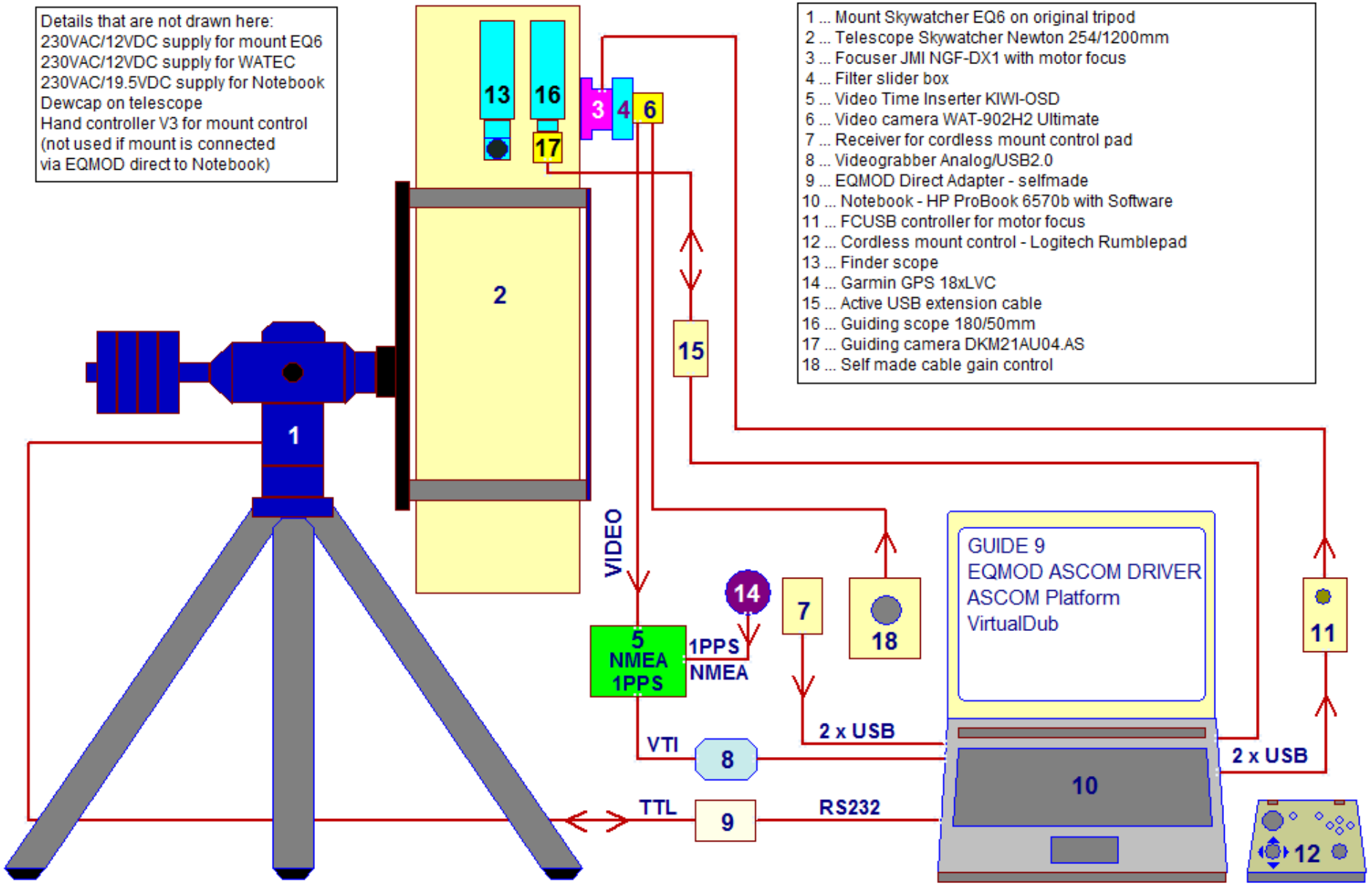
Explanation of columns 'PhGrMrCeDb'
Ph - Phase of the event.
1st character D = disappear, R = reappear, B = blink, F = flash, M = Miss
2nd character D = dark limb, B = bright limb, U = in umbra of lunar eclipse
Gr - G if the event is during a graze
Mr - Method of timing and recording. Main types are:
G = video with time insertion, V = video with other time linking
S = visual using a stopwatch, T = visual using a tape recorder, E = eye/ear
Ce - Certainty. 1 = certain, 2 = may be spurious, 3 = most likely spurious
Db - Double star indication - West, East, North, South, Brighter, Fainter

The profile graphic is derived from the evaluation of the measured data



[Diagram from Mitsuru Soma, Japan](http://optik2.mtk.nao.ac.jp/~somamt/files/sm160508akl.png)

Diagram of equipment setup on May 08, 2016



Thank you for your attention!

Any questions?